No. 3. — *Zoological Results of a Fifth Expedition to East Africa*

III

Reptiles from Nyasaland and Tete

By Arthur Loveridge

CONTENTS

INTRODUCTION

The principal collection on which the following report is based, was made by the author while investigating the fauna of the largely deforested mountains of Nyasaland. The enquiry was jointly financed by grants from the Penrose Fund of the American Philosophical Society, and from the Museum of Comparative Zoology on whose behalf it was carried out.

A synopsis of the itinerary is given in the caption accompanying Plate 1 — a map showing the position of the principal collecting localities. Altitudes and other information regarding the various camps will be furnished in the final report of this series which will deal with the general conclusions.

The period of collecting reptiles was from July 17, 1948, to April 20, 1949, during which time 1,120 reptiles, representing 101 species or races, were collected. However, in 1946 (May 27 to October 1) the Vernay-Nyasaland Expedition of the American Museum of Natural History visited the Protectorate in search of mammals, and incidentally gathered 116 reptiles. These Mr. C. M. Bogert of the American Museum kindly submitted to me for identification and incorporation in this report. Of the 37 species collected by the Vernay party I find 5 that I myself failed to encounter in the field.

After elimination of 13 non-Nyasaland species or races that I obtained at Kasumbadedza, on the south bank of the Zambezi five

miles west of Tete, a combination of the two collections reveals that between us we obtained 97 of the 110 species of reptiles now known to occur in Nyasaland. A breakdown of this figure shows it to be composed of 1 species of crocodile, 6 of tortoises and turtles, 51 of lizards, and 52 of snakes.

The last summary of Nyasaland's herpetofauna appeared over fifty years ago when Boulenger (1897e, pp. 800–801) listed 1 crocodile, 14 kinds of lizards, and 22 species of snakes collected by Alexander Whyte, naturalist to the six-year-old Protectorate. Subsequent additions brought the total up to 83; a figure now increased by nearly 33 per cent as a result of the Vernay expedition securing 2 species of lizards, and the Harvard expedition 18 forms of lizards, 6 species of snakes and 1 turtle new to Nyasaland's herpetofauna.

Of these, ten (plus one from near Tete) are here described as new, viz:

Pachydactylus tetensis sp. nov., Kasumbadedza, Tete, Mozambique.
Chamaeleo goetzei nyikae subsp. nov., Nyika Plateau at 7500 feet.
Brookesia nchisiensis sp. nov., Nchisi Mountain at 5000 feet.
Brookesia platyceps carri subsp. nov., Lichenya Plateau at 6000 feet.
Mabuya bocagii mlanjensis subsp. nov., Lichenya Plateau at 6000 feet.
Mabuya hildae sp. nov., Nyika Plateau at 7500 feet.
Mabuya varia nyikae subsp. nov., Nyika Plateau at 7500 feet.
Melanoseps ater misukuensis subsp. nov., Misuku Mountains, 6000 feet.
Platysaurus mitchelli sp. nov., Ruo River, Mlanje Mountain, 3,000 feet.
Platysaurus guttatus nyasae subsp. nov., Blantyre-Tete Road south of Mpatamanga Bridge, Nyasaland.
Lycodonomorphus rufulus mlanjensis subsp. nov., Ruo River, Mlanje Mountain.

In addition to the foregoing new forms, the undermentioned species or races are recorded from Nyasaland or Mozambique for the first time.

New for Nyasaland
Pelusios subniger (Lacépède)
Hemidactylus mercatorius Gray
Chamaeleo dilepis petersii Gray
Mabuya maculilabris comorensis (Peters)
Mabuya maculilabris boulengeri Sternfeld
Mabuya lacertiformis (Peters)
Scelotes arnoldi (Hewitt)
Riopa modesta modesta (Günther)
Melanoseps ater ater (Günther)

Gerrhosaurus major grandis Boulenger
Gerrhosaurus n. nigrolineatus Hallowell
Ichnotropis capensis (A. Smith)
Natriciteres olivacea uluguruensis (Loveridge)
Dasypeltis scaber medici (Bianconi)
Dasypeltis scaber palmarum (Leach)
Crotaphopeltis hotamboeia tornieri (Werner)
Atheris nitschei rungweensis Bogert

In addition to the previously undescribed *Pachydactylus,* the following are additions to the Mozambique fauna.

New for Mozambique
Lygodactylus picturatus picturatus (Peters)
Afroedura transvaalica ? transvaalica (Hewitt)
Mabuya striata ellenbergeri Chabanaud

In view of my having all but 13 of the kinds of reptiles known to occur in Nyasaland, it appeared advisable to extend the scope of this paper so that it might serve as a basis for a herpetology of the country. The actual coverage can best be defined under the various headings employed.

Citations of literature. These are restricted to the original description of each species, together with only such of its synonyms as were described from Nyasaland or Tete. For these the citations are given in full and consequently omitted from the Bibliography on pp.296-301. They are followed chronologically by every reference to Nyasaland material in herpetological literature with the exception of Boulenger's (1915–1920, Proc. Zool. Soc. London) regional keys to African snakes. As many of Boulenger's "species" are composites, their inclusion or omission would require endless qualifications.

As there are numerous additions and some difference in pagination in the faunal lists appearing in the first (1897) and second (1898) editions of Sir Harry Johnston's standard work "British Central Africa," both are cited. The third (1906) edition, however, is omitted as it is merely a reprinting of the second. These lists were evidently based on the material sent home by Sir Harry, who was insufficiently acquainted with nomenclatorial procedure to realize that *Coronella olivacea* and *Tropidonotus olivaceus,* or *Ahaetulla irregularis* and *Chlorophis irregularis,* were but two species assigned to different genera by Günther and Boulenger respectively. I might add that the inclusion of *Ablepharus carsonii* and *Clotho rhinoceros* = *Bitis gabonica* were

based on specimens from Northern Rhodesia, which at that time was part of British Central Africa.

Material. The reptiles resulting from the American Museum of Natural History (A.M.N.H. for short) Vernay Expedition of 1946 are listed first, followed by the specimens I collected in 1948–1949. The latter, catalogued in the Museum of Comparative Zoology (M.C.Z.), are arranged from North to South so that Mozambique material — whether from Beira or Kasumbadedza, five miles west of Tete — always appears last. As the village of Kasumbadedza is not shown on most maps, the material I procured there is listed as from "near Tete, M." and is regarded as topotypic of the 27 species described from Tete, or of the types taken by Livingstone's "Zambesi Expedition" lacking precise locality, for his party stayed at Tete, which is on the Zambezi. Zambezi, the preferred spelling of Webster's Dictionary and the Encyclopaedia Britannica, is employed in preference to Zambesi; similarly Nyasa is used instead of the archaic "Nyassa" of Livingstone.

Records. Under this heading all Nyasaland localities mentioned in the literature prior to 1950 are listed alphabetically, followed by the initial of the first author to identify the particular species from that place. Specimens attributed to the "Shire Highlands" by Günther, usually came from Mlanje or Zomba Mountains and reappear in Boulenger's catalogues with the more precise localization. There is much confusion, however. For example, the reptiles and amphibians listed by Günther, 1894a(1893), in the Proc. Zool. Soc. London, appear in the British Museum catalogue as from Zomba. Yet many of the species, such as *Cycloderma frenatum*, obviously came from Lake Nyasa, having been obtained there during Alexander Whyte's visit to Fort Johnston as indicated by P. L. Sclater in his footnote (p. 618) to Günther's paper. The explanation appears to be that Whyte failed to label his material individually, and on returning to his headquarters at Zomba, he turned over the collections to Sir Harry Johnston to transmit to the British Museum.

Equally unfortunate is Boulenger's (1897e, pp. 800–801) listing of 25 reptiles and 12 amphibians as collected by Whyte on the "Nyika Plateau, 6000–7000 ft." Actually, of these 25 reptiles only 2 ("*Mabuia varia* and *Trimerorhinus tritaeniatus*") or rather subspecies of them, occur on the windswept grasslands of the plateau. The others *may* have been taken on the eastern slopes at Kondowe (Livingstonia Mission) where Whyte stayed, though the more probable habitat for many of them would appear to be the lakeshore directly below the

mission in the neighborhood of 1600 feet. To invite attention to the matter I have entered under the heading *Records* "Nyika Plateau" in quotation marks and omitted the 6000–7000 ft.

Specimens taken by Whyte when on the way from "Kondowe to Karonga," I have cited as "Karonga to Kondowe" so as to conform to the alphabetical arrangement of all place names. When I mentioned another of Whyte's localities to Mr. C. W. Benson, whose intensive studies of the Nyasaland avifauna are well-known, he advised me to accept Whyte's type localities with caution as those of several of his birds and mammals were unquestionably incorrect.

In Whyte's time, I imagine, the differences between the herpetofauna of Zomba (township) and Zomba Plateau were more pronounced than is the case today. Yet "Zomba" was apparently used rather loosely for both. While it is customary for Nyasaland residents to refer to Zomba Plateau or Zomba Mountain, one never hears mention of Nyika Mountain, though some such definition is needed for the faunistically distinct slopes below the 7000–foot plateau.

In the case of other mountains everyone seems to speak of Mt. Chiradzulu, or Mt. Cholo. For the sake of uniformity I prefer to cite them as Chiradzulu Mtn. or Cholo Mtn. so as to conform to the usual treatment of other ranges like Mlanje or the Misuku Mountains.

The letter in parentheses following each record is an identifying initial for the author from whose published writings it has been taken. In the case of Bogert, Gray and Nieden the name is given in full, otherwise:

B = Boulenger	H = Hewitt	M = Mitchell
D = Duff	J = Johnston	P = W. Peters
G = Günther	L = Loveridge	S = Sternfeld

Also included are localities taken from a manuscript list of live material captured by Mr. B. L. Mitchell (M. ms.), to whom I am indebted for this privilege. Only those records were used where there seemed little doubt as to the identification. Questionable determinations are omitted as it is unlikely that the actual specimens have been preserved for study purposes.

Native names. So far as was possible I have recorded the names applied to specific reptiles only by the tribesmen in whose territories they were found. As these names had to be discussed through the medium of Swahili or an interpreter, I make no claim that the outcome is wholly satisfactory though every effort was made to get them

correct. The results can be compared with the names furnished by Mitchell (1946, pp. 41–42), the only person in Nyasaland, so far as I am aware, who has made any serious attempt to collect reptilian names in the vernacular. In a few instances our answers conflict, but not to the extent my Nyungwe names differ from those published by Wilhelm Peters (1882a) after his stay at Tete during the years 1844–5.

The English names often inserted under this heading, have had their group names hyphenated for the sake of uniformity, e.g. Mlanje Flat-Lizard, Rhombic Egg-eater, Cape Vine-Snake, to avoid misapprehensions that it is a lizard of the Mlanje Flats, a snake of the Cape Vines, etc. These names are included in the hope that they may become standardized in the Protectorate and render this contribution to its herpetology useful to a wider circle of Nyasalanders than would otherwise be the case.

Breeding. On this subject a mass of information will be found about which I hesitate to generalize in view of the difference in seasons existing between north and south Nyasaland, to say nothing of the altitudinal factors that should be taken into consideration. The data requires digesting by a resident naturalist with year-round experience of local factors in more normal seasons than those of 1948–9.

Other information will be found under the headings of Sexual dimorphism, Diet, Parasites, Enemies, Temperament, Aestivation and Hibernation, Habits, Habitat, and Folklore.

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The opportunity is taken of thanking Dr. A. S. Romer, Director of the Museum of Comparative Zoology, for his friendly support of these investigations, and the Trustees of the Penrose Fund of the American Philosophical Society for a substantial grant towards the expenses of the expedition. The Administration of Nyasaland without whose assistance the execution of my plans would have been well-nigh impossible in a year of almost unprecedented drought and gasoline shortages. Also thanks are due to Mr. B. L. Mitchell of the Fish and Tsetse Department for furnishing me with local information regarding the reptiles in which he is so much interested.

Of the reptiles mentioned in this paper, the types of 42, exclusive of any described by Sir A. Smith, are in the British Museum together with the material on which most of the earlier records are based. Some of these I was able to examine when passing through London,

but since my return Dr. H. W. Parker and Mr. C. J. Battersby have patiently answered innumerable questions that have arisen in the course of this work. I am especially grateful to them for their willingness to take the time necessary to settle the points raised.

I would also express my thanks to Mr. C. M. Bogert for allowing me to include the material collected by the Vernay-Nyasaland Expedition for the American Museum of Natural History, and supplying information regarding it. Mons. Jean Guibé (Museé d'Histoire naturelle) and Dr. A. A. Themido (University of Coimbra) also answered questions regarding specimens in their care, as did B. R. Fuller, Esq., Assistant Conservator of Forests, respecting the absence of palms on Nchisi Mountain.

The profitless task of identifying the insects present in lacertilian stomachs has been performed by my entomological colleagues — Drs. J. C. Bequaert, W. L. Brown, P. J. Darlington and F. Werner, to all of whom I am truly grateful. I also wish to thank Mr. J. T. Lucker for determining the nematode parasites, Prof. M. C. Meyer for doing the leaches, and Mr. Russell Olsen for settling nomenclatorial questions involving a knowledge of the classics.

For most of the photographs illustrating this paper I am indebted to my wife and her sister, Miss Hilda Sloan; to Mr. J. A. Lennon of Port Elizabeth go my thanks for the snapshot of a bird-eating chameleon; to Dr. P. E. Vanzolini for kindly photographing the new gecko; and to the Zoological Society of London for permission to use the text figures accompanying the synoptic key for identifying Nyasaland snakes.

SUMMARY OF TAXONOMIC ALTERATIONS

Trinomials, which were not employed by Boulenger for designating geographical populations, are required for no less than 75 of the 118 forms listed in this paper. Corrected misidentifications from the earlier literature will be found in the citations but are far too numerous to list here. Apart from such corrections, little real synonymizing has been necessary; only the undermentioned being considered new synonyms.

Crocodylus niloticus pauciscutatus Deraniyagala	= ? *Crocodylus niloticus* Laurenti
Hemidactylus gardineri Boulenger	= *Hemidactylus mercatorius* Gray

Lacerta cameranoi Bedriaga is adult of *Nucras intertexta ornata* (Gray)

Latastia bredoi de Witte = *Latastia johnstoni* Boulenger
Ichnotropis longipes Boulenger = *Ichnotropis capensis* (Smith)
Ichnotropis overlaeti de Witte & Laurent = *Ichnotropis capensis* (Smith)
Glypholycus whytii Boulenger now *Lycodonomorphus rufulus whytii* (Blgr.)
Tarbophis barnumbrowni Bogert = *Crotaphopeltis h. hotamboeia* (Laurenti)
Aparallactus ulugurensis Barbour & Loveridge is adult of *A. guentheri* Boulenger, which was based on a faded juvenile.

The undermentioned races which I have hitherto regarded as synonyms are revived.

Holaspis guentheri laevis Werner is revived for the East African race.
Psammophylax tritaeniatus variabilis Günther is revived for the dark-bellied montane form found south of the equator, previously miscalled *t. tritaeniatus* which is a white-bellied, brightly colored, lowland race.
Thelotornis kirtlandii oatesii Günther is revived for certain lowland vine-snakes of Nyasaland, Southern Rhodesia, and probably Angola.
Aparallactus guentheri Boulenger is revived from the synonymy of *A. capensis* Smith, from which it is distinguished chiefly by color and size.

INDEX TO LIST OF SPECIES DEALT WITH

* An asterisk is employed to denote non-Nyasaland species that were collected near Tete on the south bank of the Zambezi, Mozambique.

SYSTEMATIC DISCUSSION

CROCODYLIDAE

Crocodylus niloticus Laurenti

Crocodylus niloticus Laurenti (part), 1768, Syn. Rept., p. 53: "India orientali, et Aegypto."

Crocodilus niloticus Boulenger, 1897e, p. 800; Johnston, 1897, pp. 355, 361; 1898, pp. 355, 361; pl. xxiv; Duff, 1906, p. 132; Mitchell, 1946, pp. 16, 40.

2 skulls (M.C.Z. 50301–2) Chipoka. 3.ii.49.
Eggshell (M.C.Z. 50303) near Mtimbuka. 17.ii.49.

Records. Chikwawa (J); Chiromo (M); Chiuta Lake (M); Nkata Bay (D); also the following records from Mitchell ms.: Fort Johnston; Monkey Bay; Port Herald.

Native name. Ngwena (Yao).

Variation. It may be wondered why trinomials are not employed in view of Deraniyagala's (1948, p. 31) action in separating Lake Rudolf crocodiles under the name of *C. n. pauciscutatus.* This he did principally on the basis of the number of transverse rows of dorsal scutes averaging slightly less for the six Rudolf specimens available to him, one of which had 15, four 16, and one 17 transverse rows.

Through the courtesy of Mr. Robert F. Inger I am able to furnish the counts of nine *niloticus* (from Senegal; French Sudan; Anglo-Egyptian Sudan and Bechuanaland) in the collection of the Chicago Natural History Museum. One has 15, four 16, and four 17 transverse rows.

Unfortunately there is no Rudolf material in the Museum of Comparative Zoology, but of fourteen *niloticus* from other parts of Africa and Madagascar, two have 16, one is doubtful, and eleven have 17 transverse rows. If the intermediate specimen be omitted and these figures added to the thirteen *niloticus* seen by Deraniyagala and the nine counted by Inger, we have the following figures for the typical form: two with 15, six with 16, and twenty-seven with 17 transverse rows.

It might be added that the specimens in the Museum of Comparative Zoology with 16 rows are from Mababo, Madagascar (M.C.Z. 16731, an adult), and the Tsavo River, Kenya Colony (M.C.Z. 7991), the latter being one of two hatchlings, the second possessing 17 rows.

The other character cited by Deraniyagala as distinguishing *pauciscutatus,* viz. "median row of ventral scutes enlarged," is too variable a one to be utilized on account of the occurrence of many

intermediate conditions. The median ventral scutes are very conspicuously enlarged in two Malagasy crocodiles (M.C.Z. 16731, 16868), but not so in others from the same island.

From the small sample of Rudolf crocodiles available it certainly appears as if they exhibit some slight average difference in the number of transverse rows of dorsal scutes, but insufficient to justify recognition until adequate sampling from all parts of Lake Rudolf shows we are dealing with a really representative series of the population which can be distinguished in conformity with Dunn's law.

In the same paper Deraniyagala (1948, p. 30) casually mentions the eight-foot crocodiles of Lake Baringo, suggesting that they might be called *C. n. worthingtoni* should they prove to be distinct. I merely mention it here as the name is apt to be overlooked owing to the unfortunate manner of its proposal in the text. Dwarfed crocodiles in restricted bodies of water have been reported to me from points as far apart as Karamoja in Uganda east to Ethiopia and south to Swaziland.

Size. Of the skulls listed above, viz. M.C.Z. 50301 and 50302.

Length from snout to rear of quadratojugals	535 mm.	520 mm.
Length from snout to rear of squamosals	503 mm.	478 mm.
Width of skull across the quadratojugals	305 mm.	250 mm.

In other words the overall lengths of these crania were 21⅛ and 20½ inches, yet their greatest widths were 12″ and 9⅞″ respectively. This disproportion, alleged to be sexual, was reflected in the bodies, one being robust and thick-set, the other slender, though their lengths appeared much the same. The crocodile with the larger skull was measured by Mr. C. C. Yiannakis, who told me it was 13 feet, 10 inches. Assuming this to be correct the reptile was slightly more than seven times the length of its cranium, the proportions found by K. P. Schmidt for other species.

Breeding. Hearing that crocodiles nested on an isolated sandy beach just north of Wright's place, three or four miles up the coast from Mtimbuka, I rowed there. On landing I found two nests from which young had hatched out fairly recently. Eggshells were strewn around and trails of both young and old crocodiles were plentiful. The dune-like site was overgrown with scrub, interspersed with swamps, and one largish, though shallow,lagoon in which could clearly be seen a number of crater-like excavations. These, said my native guide, who was the local Fisheries Department headman, had been made by crocodiles

for the benefit of their young. Never before having heard of such a practice I cannot say whether it is correct.

Diet. Fish form the principal food of these Lake Nyasa crocodiles, to whom fish offal is a great attraction. Employing some as bait, on the night of my arrival at Chipoka, Mr. C. C. Yiannakis snared, then shot, a crocodile on the beach less than a hundred yards from his house. Next morning I called on Mr. Yiannakis who said I might have the head after removal of the hide; he took me to see the reptile which his boys declared was a female. The alleged male was taken in the same snare the next night.

The following evening, with both corpses in tow, Yiannakis took me in his motor launch two miles down the lake to a reed-grown, sandy bay. This, said Yiannakis, was headquarters on this part of the lake for crocodiles, which could be depended on to devour their defunct companions. The two we had brought them must have weighed about 400 pounds each, so dragging the carcasses up the slightly sloping sandbank was an arduous undertaking for the five Africans accompanying us. After the heads had been chopped off with an axe for me, the corpses were cut in sections that could be dragged far into the reeds, so far that their companions would not be tempted to drag them back into the lake. Only when personally satisfied that this had been done, would Yiannakis consent to leave them.

It was dark long before we beached at Chipoko and the already stinking trophies could be transferred to the back of our truck for the drive to the house I was occupying on the shore at Mtimbuka.

Early next morning I had the heads carried down to the shore and buried in a deep hole about ten feet from the water's edge and a hundred feet from the house. Fairly heavy branches were piled on top of the foot of sand that covered the uppermost head. Nevertheless, that night a crocodile left the lake exactly opposite the burial place, walked to it and scraped away the covering sand till it had exposed a bit of one head. The next night two crocodiles came, pushed aside the branches and dug out one of the heads, now seething with maggots, but did not eat it. On discovering what had happened I had the heads reburied deeper and a cairn built over them. Three weeks later we dug up the two skulls, both beautifully white and clean.

From the next beach to this one a crocodile had taken a young boy one afternoon last year, I was told, but Yiannakis, who has been conducting extensive fishing operations on the lake since 1934, tells me he has not lost any men since 1936 when two were taken by crocodiles.

On the second occasion, attracted by the shouts of his men, Yiannakis and his cousin took the launch and went out to the boats engaged in fishing. The cousin caught sight of the crocodile and fired, the first bullet cutting through the fingers of both reptile and man; the second shot hit the crocodile in the head and killed the monster; on being taped it was found to measure 18 feet, 10 inches. Unfortunately, having no means of preserving so large a specimen, they threw it back into the lake. The victim was dead but he was the last of Yiannakis' men to be so killed, though crocodiles sometimes swarm about the nets when fishing operations are being conducted at night.

At Kasumbadedza, on the south bank of the Zambezi, I was summoned by two small goatherds to shoot a crocodile that had seized one of their charges. The goat was a large one and had struggled free before I reached the spot, though just opposite my tent. The goat, a white one, could be seen bobbing along in the brown current a quarter-mile down stream. Even as we looked it became the center of a violent contest between several crocodiles, one of whom, rearing upright in the water, exposed fully five feet of throat, breast and belly gleaming white in the afternoon sunshine. One of the herds drew my attention to the snouts and crowns of two crocodiles floating off-shore below us, declaring the larger was the reptile that had dragged his goat into the river. I missed one but got the second in the head; churning the water, it sank.

A few days later I was called to shoot a female kudu that had been driven into the river by a huntsman's curs. The animal, big as a pony, had evidently relinquished its attempt to swim the river and was now battling the current fifty feet off shore. Presently it turned and reached shallow water where it stood facing the wildly excited pack of yelping dogs, while behind it rose several crocodile snouts as three sinister pairs of eyes surveyed the scene.

Folklore. A 'charm', consisting of two crocodile teeth securely sewn together in a scrap of khaki so as to form a crescent from which the points alone projected, was brought back for the Peabody Museum. This seemingly harmless ornament would — after appropriate spells had been employed — allegedly lure an intended victim to the water-side where a crocodile was lying in wait to seize him! It had been purchased from a Chikunda sorcerer near Port Herald by an African. In 1911 this man was arrested for stealing growing maize. During the ensuing trial the accused said he stole the maize because the sorcerer had sold him 'medicine' that was to render him invisible. Unfortunately

for the would-be thief his faith was unequal to the occasion when he saw a policeman passing by the plot he was engaged in robbing. The native took to his heels and by doing so aroused in the askari a reaction similar to that produced in a cat by a speeding mouse. The askari gave chase and captured the thief in whose possession the crocodile 'charm' was found. After the trial it passed into the possession of the then medical officer, Dr. J. O. Shircore, to whom I am indebted for these particulars as well as the specimen.

TESTUDINIDAE

Testudo pardalis babcocki Loveridge

Testudo pardalis Johnston (not of Bell), 1897, p. 361; 1898, p. 361; Mitchell, 1946, p. 20.

Testudo pardalis babcocki Loveridge, 1935, Bull. Mus. Comp. Zool., **79**, p. 4: Mount Debasien, Karamojo, Uganda.

3 ♂♂, 3 ♀♀ (M.C.Z. 50304–9) near Tete, M. 8–19.i.49.

Records. Tengani, Port Herald (M). Mitchell is the first to furnish an authentic record of its occurrence in Nyasaland, for Johnston merely lists it as a possibility in parentheses along with five other members of the family which certainly do *not* occur within the Protectorate. One (*T. calcarata* = *sulcata*) being confined to Abyssinia, while the other four (*T. angulata, T. geometrica, H. areolatus,* and *H. femoralis*) are known only from south of the Zambezi.

Native name of the Eastern Leopard-Tortoise. *Kamba* (Nyungwe).

Size. Largest ♂ (M.C.Z. 50307) 218 mm. in carapace length; largest ♀ (M.C.Z. 50309) 297 mm. Range of series 60–297 mm., the height being included in the length from 1.81 (youngest) to 2.07 (adult) times; therefore within the limits of this deep-shelled race.

Habitat. As these leopard tortoises were brought alive to my camp at Kasumbadedza Village (*circa* 250 feet), the alternative name of "mountain tortoise" is hardly merited for they were almost certainly found in the vicinity or in the low hills a few miles south of the Zambezi plains.

Kinixys belliana belliana Gray

Kinixys Belliana Gray, 1831, Syn. Rept., p. 69: No locality.

Cinixys belliana Johnston, 1897 and 1898, pp. 356, 361; Duerden, 1907a, p. 9.

Kinixys belliana zombensis Hewitt, 1931, Ann. Natal Mus., **6**, p. 469, fig. 1c,

pl. xxxviii, fig. 17: Zomba, Nyasaland (founded on a ♀; it will be noted that fig. nos. on plate do not correspond with text in this and next form); Mertens, 1934a, p. 63.

Kinixys youngi Hewitt, 1931, Ann. Natal Mus., **6**, p. 486, fig. 1d, pl. xxxvii, figs. 10–11: Lake shore near Livingstonia, Nyasaland (founded on two ♀♀, also a ♂ taken 120 miles from Livingstonia). Mertens, 1934a, p. 8.

Kinixys zombensis Mitchell, 1946, p. 19.

♀ (A.M.N.H. 67849) Chibotela. viii–ix.46.
10 ♂♂, 10 ♀♀, 2 yng. (M.C.Z. 50311–32) Mtimbuka. 7–26.ii.49.
♀ (M.C.Z. 50310) Mpimbi, Zomba. iv.49.
yng. (M.C.Z. 50333) Cholo Mtn. 18.iii.49.

Records. Below Livingstonia (H); Ngoniland (H): Zomba (H). Also the following records from Mitchell ms.: Chikwawa; Chiromo; Chitala River; Fort Johnston; Likangala; Monkey Bay; Port Herald; Zomba.

Native name of Eastern Hinged Tortoise. *Ngongo* (Yao).

Variation. Hewitt's names were based on individual variations and do not represent recognizable races unless it can be demonstrated, as I (1936j, p. 218) once supposed, that a low-shelled form occurs in arid, rocky areas. In that event an earlier name (*Kinixys belliana spekii* Gray, 1862: Tanganyika Territory), of which *youngii* is a synonym, is available. The Mtimbuka series certainly represent this shallow form.

Mr. Mitchell kindly gave me the Mpimbi tortoise, which represents the high-vaulted type, but the Cholo juvenile which might be expected to agree with typical *belliana* in proportions is actually more extreme than any Mtimbuka specimens, including those of approximately the same length, as will be seen from the following data.

It was for reasons of this nature, based on Kenya-Tanganyika material, that I (1942e, p. 247) reluctantly synonymized *spekii*. However, it need not be assumed that the matter is settled, but it is to be hoped that subspecific names will not be employed unless supported by adequate material that demonstrates beyond question that the separation really has geographical significance. Trinomials are used because west of Togoland *K. b. nogueyi* Lataste has only four claws on each front foot.

Size. Except in occasional specimens where the gulars of the plastron project beyond the carapace, "shell length" corresponds with carapace length.

	Length	Height	Breadth
largest ♂ (M.C.Z. 50314)	190 mm.	80 mm.	122 mm.
largest ♀ (M.C.Z. 50321)	207 "	88 mm.	135 "
Mpimbi ♀ (M.C.Z. 50310)	193 "	90 "	131 "
Mtim. juv. (M.C.Z. 50331)	72 "	32 "	62 "
Cholo juv. (M.C.Z. 50333)	72 "	32 "	59 "
smallest (M.C.Z. 50332)	64 "	28 "	55 "

Thus height of the Mpimbi ♀ is included in its length 2.14 times, that of ten Mtimbuka ♀♀ .....from 2.26 to 2.58 times, that of ten Mtimbuka ♂♂ .....from 2.25 to 2.48 times, that of two Mtimbuka and one Cholo young from 2.25 to 2.28 times.

TRIONYCHIDAE

Cycloderma frenatum Peters

Cycloderma frenatum Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 216: Zambezi River, Mozambique. Günther, 1894a (1893), p. 618; Johnston, 1897 and 1898, pp. 256, 361; Tornier, 1900b, p. 583; Mitchell, 1946, pp. 21, 41.

3 eggs (M.C.Z. 50344) Mtimbuka. 7.ii.49.
20 juv. (M.C.Z. 50345–56) Mtimbuka. 7–28.ii.49.
3 ♀♀ (M.C.Z. 50357–9) Mtimbuka. 10–28.ii.49.
juv. (M.C.Z. 50360) Chowe. 12.ii.49.

Records. Fort Johnston (G); ? Lake Chilwa (M); Lake Nyasa (Tornier's records are really extralimital as they refer to the northeast shore, chiefly Manda, former Wiedhaven); Monkey Bay (M. ms.); Shire River (M).

Native names. Nkhasi (Yao, but also applied to *Pelusios*); *litetamera* was what the Yao on the Ruvuma River (Loveridge, 1942e, p. 251) called this Zambezi Mud Turtle, a more appropriate name than "Soft-shelled Turtle" for a species with so well-developed a bony carapace.

Color. The heads of hatchlings all exhibit characteristic markings which, above, consist of a light-edged dark interorbital crossbar, and five similar, but wavy and sometimes broken, longitudinal lines from near occiput to base of the long neck; below, the throat and neck may be pure white or show some dusky streaks. The skin covering the carapace varies from pale gray to leaden, with usually a white edge around the periphery; the plastron may be almost white, but more usually has an irregular black blotch about the umbilicus, an elongate

oblique one near each forelimb, a rounder one anterior to each hind limb, and a smaller sixth spot in the anal region.

Size. Overall shell length of the three adult ♀♀ was, in life, substantially the same, viz. length 560 mm., breadth 418 mm., but with shrinkage of the leathery integument they are now approximately 435 and 360 mm. The head and neck of M.C.Z. 50357 measured 420 mm., while breadth of head was 100 mm. Overall shell lengths of the young range from 40–48 mm., their breadth 30–36 mm.

Breeding. On February 7th natives brought in three clutches of eggs numbering 15, 16, and 19 respectively, but whether complete sets I cannot say. The three adults, undoubtedly captured when coming ashore to lay on the 10th, 19th, and 28th, all held spherical, hard-shelled eggs ranging from 33 to 35 mm. in diameter. One ♀ laid 3 eggs before being killed, 19 more were present in her oviducts, and many shell-less ova of various sizes were present in the ovaries.

On February 7th, the fourth day after a heavy downpour that terminated about eight months drought (but did not inaugurate the rains as was hoped), a young turtle with carapace caked in mud was found. On many others the umbilical suture was still unhealed.

Diet. Mitchell (1946, p. 21) states that these turtles subsist principally on aquatic snails and mussels. At Mtimbuka I found the former were *Lanistes ellipticus* and *L. sordidus*, though we collected two other species elsewhere in the lake. The clams proved to be *Mutela alata* and *simpsoni*, with a robust cockle-like shell (*Caelatura nyassensis*) especially abundant.

Later Mitchell (3.ii.47), who has added more to our knowledge of this turtle's habits than anyone, wrote me that two young *frenatum* in a tank in his garden came readily to feed on strips of fish and raw meat which they would take from his fingers.

Parasites. Two leaches of the family Glossiphonidae, possibly *Placobdella jaegerskioeldi*, removed from the base of the neck of M.C.Z. 50357, were so poorly preserved that Prof. M. C. Meyer considers a more definite assignment inadvisable.

Enemies. On the village middens around Mtimbuka I saw (11.ii.49) scores of eggshells. My Yao headman, whose home is only a few hours north of Mtimbuka, accepted turtle eggs gladly; the rest of my sophisticated staff scorned the idea of eating them. I ate 18, having them scrambled six at a time for breakfast, and though not nearly as nice as fowl eggs they were quite edible.

Temperament. All three females were timid, shy, and inoffensive, so that when Johnston (1897, p. 356) says that *Cycloderma* turtles "are very fierce," he is apparently attributing to them the reputation of the American soft-shelled turtles of the genus *Amyda* (now separated from the oriental *Trionyx*).

Habits. During the month of January, which I spent in camp on the Zambezi near Tete (true type locality for *frenatum*), I made every effort to secure topotypic material but without success. Native fishermen and others asserted that these mud turtles would not be seen until the rains, already two months overdue, broke.

PELOMEDUSIDAE

Pelomedusa subrufa subrufa (Lacépède)

La Roussatre Lacépède, 1788, Hist. nat. Quadrup. ovip. Serpens, **1**, p. 173, pl. xii: "de l'Inde," as Sonnerat coll., restr. to Cape.

Testudo subrufa Lacépède, 1789, Hist. nat. Quadrup. ovip. Serpens, **2**, Synopsis methodica (a table in which binomials are employed).

Pelomedusa galeata Hewitt, 1935, p. 325.

Pelomedusa subrufa subrufa Loveridge, 1941d, p. 470.

♀ (M.C.Z. 50334) Lirangwe near Blantyre. 1949.

Records. Mr. B. L. Mitchell, to whom I am indebted for this Southern Marsh-Terrapin, informs me he has taken the species also at Chitala River and Chiromo. The only record in the literature is of a Livingstonia specimen collected by W. P. Young (H).

Variation. Hewitt suggests the Livingstonia terrapin represents a "distinct form." This appears unlikely, however, as at the time I (1941d, p. 470) revised the family no valid grounds could be found for recognizing any of the four South African races proposed by him. As is usual in the typical form, the pectoral shields are broadly in contact.

Size. Carapace length 149 mm.; breadth 118 mm.; height 52 mm.

Pelusios subniger (Lacépède)

La Noiratre Lacépède, 1788, Hist. nat. Quadrup. ovip. Serpens, **1**, p. 175, pl. xiii: No type locality.

Testudo subnigra Lacépède, 1789, Hist. nat. Quadrup. ovip. Serpens, **2**, Synopsis methodica (a table in which binomials are employed).

juv. (A.M.N.H. 67850) Chibotela. 24.viii–8.ix.46.
juv. (M.C.Z. 51100) Shire River at Port Herald. 1949.

Records. The juvenile side-necked water-tortoise from the Shire River near Murchison Rapids compared with *subniger* by Gray (1863c, p. 405) appears to have been a young *sinuatus*, judging by the description furnished by Gray. The specimen is not in the British Museum and Dr. H. W. Parker suggests that it may have been presented to the zoological gardens alive.

The side-necked water-tortoise referred to as the "Lower Shire Pelusius" (*sic*) by Mitchell (1946, p. 20) is presumably this Black Water Tortoise, probably also Mitchell's "Chilwa Pelusius" with a carapace length of nine inches, for this is the usual maximum for *subniger* in East Africa, though examples of eleven inches have been reported from the Congo. Mitchell concurs that the unidentified water tortoises taken by him at Chiromo, Chikwawa and Port Herald are also referable to this species.

Since writing the foregoing I have heard from Mr. Mitchell, who says (14.i.50): "Mr. John Handeman recently showed me two turtles from the Lower Shire, the first I have seen from there since you sent me a copy of your Revision of the Pelomedusidae. They are undoubtedly *P. subniger*, quite large specimens." Mr. J. Handeman is the collector of M.C.Z. 51100 listed above.

Color. The plastrons are yellowish with a rusty red blotch towards the posterior outer edge of each shield.

Size. Total length of larger (A.M.N.H. 67850), 100 mm.; width 78 mm.; height 43 mm.

Pelusios sinuatus (Smith)

Sternothaerus sinuatus A. Smith, 1838, Ill. Zool. S. Africa, Rept., pl. i: In rivers to the north of 25° S., South Africa. Günther, 1894a (1893), p. 618; Johnston, 1897 and 1898, p. 361.
Sternothaerus ? subniger Gray, 1863c, p. 405; 1870, p. 80.
Sternothaerus nigricans Strauch, 1865, p. 108.
Pelusios sinuatus Loveridge, 1941d, p. 502.

9 (M.C.Z. 50335–43) Mtimbuka. 7–26.ii.49.

Records. Shire River at Fort Johnston (G). Shire River near Murchison Rapids (Gray). Also taken at Fort Johnston and Monkey Bay by Mitchell.

Native name. *Nkhasi* (Yao, but applied to *Cyeloderma* also).

Variation. In this good age-series, with carapace lengths ranging from 41–300 mm., the suture between the abdominals is less than the length of the anterior lobe of the plastron in the smallest (41–90 mm.), equal to it in the medium-sized (100–189 mm.), and considerably longer in the two largest (278–300 mm.) which are both females. The vertebral shields are very variable in shape, those of the 278 mm. female being parallel-sided as in the figured type of the 274 mm. *P. s. leptus* Hewitt (1933a, p. 45, pl. ix, fig. 2), an unrecognizable form described from Isoka, Northern Rhodesia.

Color. All display the characteristic angular pattern on the periphery of the yellow (grayish in three under 44 mm.) plastron which distinguishes the Serrated Terrapin from all other species.

Size. Carapace length of ♂ (M.C.Z. 50337) 289 mm.; height 110 mm.; breadth 201 mm. For the entire series the height is included in the length from 2.5 (adult) to 3.7 (youngest) times, and the width in the height from 1.1 (youngest) to 1.3 (adult ♀ ♀) or 1.4 (adult ♂) times.

Breeding. Three young were recent hatchlings.

GEKKONIDAE

Hemidactylus mabouia (Jonnés)

Gecko Mabouia Moreau de Jonnés, 1818, Bull. Soc. Philom. Paris, p. 138: Antilles and adjacent mainland.

Hemidactylus mabuia Boulenger, 1885d, p. 123; 1891a, p. 306; 1897e, p. 800; Johnston, 1898, p. 361.

Hemidactylus mabouia Günther, 1894a (1893), p. 618; Johnston, 1897, p. 361; Mitchell, 1946, p. 22; Loveridge, 1947a, pp. 167–180.

♂ (A.M.N.H. 67814) Chibotela. viii–ix.46.
♂ (M.C.Z. 50361) Misuku Mtns. 27.ix.48.
♂ (M.C.Z. 50362) Nchisi Mtn. 3.xii.48.
3 ♂♂, 3 ♀♀ (M.C.Z. 50363–7) Chitala R. 14.xii.48.
♂ (M.C.Z. 50368) Dedza. 13.ix.48.
4 ♂♂, 2 ♀♀ (M.C.Z. 50369–70) Mtimbuka. 7–9.ii.49.
♂ (M.C.Z. 50371) Chowe. 12.ii.49.
♂ (M.C.Z. 50372) Chiradzulu Mtn. 29.viii.49.
♂ ♀ (M.C.Z. 50373–4) Cholo Mtn. 16.iii.49.

Records. Fort Johnston (G); Karonga to Kondowe (B); "Nyika Plateau" (B); Port Herald (M); Shire Valley (B); Zomba (L). Also occurs at Likabula River according to Mitchell, and seen by me on walls of Chire River Bridge rest house, Northern Rhodesia.

Native names of the House Gecko. *Kipakapaka* (Misuku); *dudu* (Chewa; Ngoni); *jusi* (Yao, fairly specific, strangely enough, as *mjusi* is Swahili for all lizards).

Variation. Upper labials 9–13; lower labials 7–11; preano-femoral pores in males 28–52; scansor rows under first toe 5–7, under fourth 7–11. These last figures are an extension of the former range 7–9, and it is to be noted that it applies solely to the eight lake littoral (Chibotela; Chowe; Mtimbuka) geckos which range from 9–11[1], but otherwise do not differ from the rest of the material. Dorsal tubercles may be conical or keeled as in the West Indies (cf. Loveridge, 1947a, p. 172).

Size. Largest ♂ (M.C.Z. 50363), 177+ (90 + 87+) mm.; largest ♀ (M.C.Z. 50364), 185 (88 + 97) mm.; smallest from snout to anus 53 mm., all three from Chitala River.

Breeding. Eggs are always laid in pairs and I am sure Mitchell (1946, p. 22) is mistaken in thinking a gecko can produce three.

Habits. These geckos were especially plentiful in the house I occupied at Mtimbuka, where one gecko in particular used to haunt the windowpane in front of my table when the lamp was lit. It amused me by incessantly twitching and waving its tail as it watched some insect. Failure to seize potential prey after a stalk almost invariably served as a stimulus for tail-waving. Nightly I heard, or was awakened by, tapping on the glazed doors or windows of my bedroom; a noise that might well startle a sleeper unacquainted with the habits of these lizards. Fortunately, I at once guessed that the rapping was caused by a gecko hammering some recalcitrant prey that objected to being swallowed.

Habitat. Taken on rocks at Chowe, in houses at Chiradzulu, Chitala, Dedza, Mtimbuka and Nchisi, at altitudes ranging from 1500 to 5000 feet on Misuku Mountains.

Hemidactylus mercatorius Gray

Hemidactylus mercatorius Gray, 1842, Zool. Misc., p. 68: Madagascar.

Hemidactylus gardineri Boulenger, 1909, Trans. Linn. Soc. London, (2), **12**, p. 296, pl. xl, fig. 4: Farquhar Island, Seychelles.

[1] In these the counts, made from tip to base, run 1 + 8 pairs + 0, 1 + 8 pairs + 1, 1 + 8 pairs + 2, the basal one or two are not always fully developed as a scansor.

Eggshell & yng. (M.C.Z. 50375–6) Nchisi Mtn. 1–3.xii.48.
2 ♂♂, 2 ♀♀, 5 yng. (M.C.Z. 50377–83) Mtimbuka. 16–28.ii.49.
3 ♀♀ (M.C.Z. 50384–6) Chikwawa. 18.iv.49.
2 ♂♂, 4 ♀♀, 3 yng. (M.C.Z. 50387–93) near Tete. 12–28.i.49.

Records. New to Nyasaland, though possibly taken by others and mistaken for the young of *mabouia*.

Native name of Palm Gecko. *Tangulengule* (Nyungwe).

Variation. Upper labials 9–12; lower labials 7–9; preano-femoral pores in *adult* males 30–31; scansor rows under first toe 4–6, under fourth toe 6–9. These last figures are an extension of the former range of 6–7, the fifteen Nyasaland geckos being 6–8, the nine Mozambique specimens 7–9.

At the British Museum I was able to examine the holotype of *mercatorius*, placed in the synonymy of *mabouia* by Boulenger, and discovered that it had 4 scansors under the first toe and 6 under the fourth so that it takes precedence over the species later described by Boulenger as *gardineri*. *H. mercatorius* is often extremely hard to separate from *mabouia* owing to the extensive overlapping. For example the hatchlings from Nchisi do not differ in scale counts from the Nchisi ♂ (M.C.Z. 50362) I have referred to *mabouia* because of its size — 62 mm. from snout to anus. Of the Mtimbuka and Kasumbadedza geckos there can be no question as gravid females were collected and young hatched from small-sized eggs.

Size. Largest ♂ (M.C.Z. 50387), 111 (51 + 60) mm.; largest ♀ (M.C.Z. 50377), 100+ (52 + 48+) mm.; smallest hatched (M.C.Z. 50383), 40 (21 + 19) mm.

Breeding. On December 3, at Nchisi, I found two eggs measuring 9 x 9.5 mm., well separated from each other and two-thirds buried in soil beneath a brick forming part of the border of the old Boma garden; these subsequently hatched (no date) producing geckos measuring 42 (22 + 20) and 43 (23 + 20) mm. respectively.

On January 12, at Kasumbadedza near Tete, two gravid females were taken and a hatchling seen on tree by tent. An egg measuring 8 x 9 mm. hatched on January 28 a 42 (22 + 20) mm. gecko (now M.C.Z. 50393). A second, spherical egg measuring 9 mm. in diameter was carried to Mtimbuka where on February 14 it hatched a 44 (22 + 22) mm. gecko.

On February 8, at Mtimbuka, a pair of eggs measuring 8.5 x 8.5 mm. were found beneath a fallen reed fence surrounding Dr. Lamborn's

garden. On February 28 both hatched and the resulting geckos were released after examination.

On February 16, at Mtimbuka, two pairs of very fresh eggs found beneath stones on rocky hill beside Dr. Fitzmaurice's house, led to my searching the vicinity and securing most of the series listed above.

Enemies. At Kasumbadedza one gecko was recovered from the stomach of a *Boaedon l. lineatus*, another from *Prosymna a. stuhlmanni*.

Habitat. To encounter this gecko at Nchisi was a considerable surprise for in the immediate vicinity there were no palms, and in my experience this species has been always associated with discarded palm fronds though found beneath other vegetable debris. In Nyasaland, the Lilongwe Forestry Officer informs me, palms are almost entirely confined to levels below 3000 feet and none occur at Nchisi so far as he is aware.

Lygodactylus capensis (Smith)

Hemidactylus capensis A. Smith, 1849, Illus. Zool. S. Africa, Rept., pl. lxxv, fig. 3: Kaffirland and districts north of Cape Colony.

Lygodactylus strigatus Gray, 1864e, Proc. Zool. Soc. London, p. 59: Southeast Africa.

Lygodactylus capensis Boulenger (part), 1885d, p. 160; Günther, 1893 (1892), p. 555; Johnston, 1897 and 1898, p. 361; Loveridge (part), 1920a, p. 135; Mitchell (trinomials), 1946, p. 23; Loveridge, 1947a, pp. 208–212.

♂ ♀ (M.C.Z. 50394–5) Nchenachena. 20.xi.48.
2 ♂♂, 6 ♀♀, 2 juv. (M.C.Z. 50396–9) Mtimbuka. 8.ii–5.iii.49.
♂ ♀ (M.C.Z. 50400–1) Chowe. 12.ii.49.
♂ (M.C.Z. 50402) Chiradzulu Mtn. 27.viii.48.
2 ♂♂, 2 ♀♀, 6 eggs (M.C.Z. 50403–5) Blantyre. 3.xii.48.
2 ♂♂, eggs (M.C.Z. 50406–8) Cholo Mtn. 17.iii.49.
♀ (M.C.Z. 50409) Chikwawa. 18.iv.49.
6 ♂♂, 9 ♀♀, 4 juv. (M.C.Z. 50410–9) Near Tete. 8–18.i.49.
6 ♂♂, 1 ♀ ? (M.C.Z. 50420–6) Beira. 17.vii.48.

Records. Fort Johnston (L); Shire Highlands (G); Zomba (L). I personally failed to find this species on Zomba Plateau; some were seen at Kausi, Lake Malombe, 25.ii.49(A.L.).

Native name of Cape Gecko. *Bunyakambalilo* (Nyungwe).

Variation. Rostral entering nostril in 9 geckos, excluded in 31; nasals 2–3; internasal granules 1–2; upper labials 6–9; lower labials 6–8; mental in M.C.Z. 50399 *only* has split off a completely separate shield

instead of being deeply fissured as called for in key; in M.C.Z. 50420 *only* there are 2 postmentals instead of the normal 3; preanal pores in twenty-one males 4–6; subcaudals correspond to key definition for *capensis* with some Beira geckos tending towards the condition found in *grotei*, a species that eventually may have to be relegated to subspecific rank (cf. Loveridge, 1947a, p. 213).

Color. Both color and pattern highly variable. In life the lateral ocelli on the Nchenachena female were so conspicuous and handsome as at first to make me think I had some new form. On the other hand many of the series from the hot and arid country around Kasumbadedza possessed so well-defined a light lateral band, usually black-edged, that I felt sure they must be *grotei* until I had examined their subcaudals.

Size. Largest ♂ (M.C.Z. 50424), 71 (31 + 40) mm., but surpassed in length from snout to anus by a ♂ (M.C.Z. 50406) of 65 (35 + 30) mm.; largest ♀ (M.C.Z. 50416), 64 (31 + 33) mm. The tails of Blantyre geckos are unusually long; for dimensions of smallest, see below.

Breeding. On December 31, at Blantyre, two lots of eggs, cemented together in pairs as is usual, measuring 5 x 7 mm., were found. In each egg of one pair is a small oval opening with neatly bevelled edge that looks as if it might have been drilled by a predatory mollusk.

On January 8, at Kasumbadedza, two hatchlings were running about my tent and a pair of eggs were collected at the base of a tree. (These subsequently hatched in transit and were discarded).

On February 18, at Mtimbuka, eggs measuring 5.5 x 6.5 mm. were found beneath fallen palm fronds. One pair hatched on March 5 two geckos (M.C.Z. 50399a) measuring 25 (13 + 12) mm. and 27 (15 + 12) mm. respectively.

On March 17, at Cholo Mountain, a pair of eggs measuring 6 x 7 mm. were found with adult geckos among debris on a hillside.

Diet. A very large termite was disgorged by one of the Cholo males taken beneath debris at some distance from the nearest bush or tree.

Parasites. Red mites (*Geckobia australis*) are numerous beneath the belly scales of geckos from Blantyre and several other localities. Kasumbadedza geckos suffered from swollen jaws, due to ?calcium deposit.

Habitat. On rocks and trees bordering road to Chiradzulu Boma; on acacias at Mtimbuka; on sapling of *Brachystegia* woodland at Chowe; on domestic bananas at Kausi.

Lygodactylus angularis angularis Günther

Lygodactylus angularis Günther, 1893 (1892), Proc. Zool. Soc. London, p. 555, pl. xxxiii, figs. 1–3: Shire Highlands,[1] Nyasaland. Boulenger, 1894e, p. 722; Boulenger, 1897e, p. 800; Johnston, 1897 and 1898, p. 361; Loveridge (trinomials), 1947a, pp. 221–222.

♀ (A.M.N.H. 67840) Zomba Mtn. v–vi.46.
3 ♂♂, 18 eggs (M.C.Z. 50427–9) Misuku Mtns. 23–30.ix.48.
♂ & egg (M.C.Z. 50430) Nchisi Mtn. 3 & 8.xii.48.
3 ♂♂, 2 ♀♀, 13 eggs (M.C.Z. 50431–6) Zomba Mtn. 2–9.ix.48.
2 ♂♂, 3 ♀♀ (M.C.Z. 50437–9) Chiradzulu Mtn. 26–30.viii.48.
♀ (M.C.Z. 50440) Mlanje Mtn. i.iv.49.

Records. Misuku Mtns. (as Masuku, B); "Nyika Plateau" (B); Shire Highlands "principally upon Mount Zomba and Mount Milanji" (G). As I have now found that the Angle-throated Gecko occurs on both Mlanje and Zomba Mountains it might be advisable to definitely designate the type locality as Zomba Plateau.

Native names. Kakalakasia (Misuku); *zumaili* (Chewa).

Variation. Internasal granules 0–1; nasals surrounding nostril 2–3; upper labials 6–9; lower labials 5–8; postmentals 2–3; preanal pores in males 7–8.

Though the foregoing data extends four of the hitherto recognized ranges of variation (Loveridge, 1947a, p. 200) and shows that 3 mentals is no longer peculiar to the Katanga race *L. a. heeneni*, being present in over 33 per cent of the Nyasaland material listed above, the western *heeneni* males remain recognizable by their possession of from 9–10 preanal pores.

Color in life. ♂ (M.C.Z. 50431). Above, rosy brown, a light-edged crossbar between orbits, a dark line from nostril through eye to above ear, another from eye to ear-opening; a series of velvety black, triangular patches on sides and some dark flecks on limbs and tail. Below, throat orange with blue-black markings, viz. a short line in mental region followed by a V-shaped one and the lateral arms of two incomplete chevrons; breast, belly, and limbs paler orange except around the anus where it is brighter; tail faintly pinkish gray.

♀ (M.C.Z. 50432). Above, as male, but snout paler. Below, yellow rather than orange, and more or less confined to a median band from chin to base of tail, thereafter fainter along basal half of tail; extending backwards from anus is a dark median streak that soon breaks up into a series of dashes.

[1] Here restricted to Zomba Plateau.

Size. Largest ♂ (M.C.Z. 50431), 82 (43 + 39) mm., that measured 88 (46 + 42) mm. in the field; largest ♀ (M.C.Z. 50440), 91 (41 + 50) mm.; on hatching 28 (14 + 14) mm.

Breeding. On August 26 in hot sunshine about 3.30 p.m., at Chiradzulu, a pair were about to mate when disturbed.

On September 9, at Zomba, a ♂ and ♀ were facing each other on a horizontal pole when I saw the ♂, raising himself high upon his forelegs, inflate his handsomely colored throat so as to display the markings.

On September 4, on the hillside above His Excellency's cottage on Zomba Plateau, 13 fresh eggs (M.C.Z. 50436) together with a last year's one that had two holes in it (? parasitized, cf. *L. capensis*) and a recently-hatched eggshell, were found close together beneath a mat of moss and leaves, mostly in a crevice between two large rocks immediately below a grass-grown slope on which were a few scattered trees. Again and again I unsuccessfully searched these trees for geckos. The eggs measured 6.5 x 7.5 to 7 x 8 mm.

On September 23, at Matipa Forest edge, three eggs were found beneath fallen slivers of bark, others under slabs of rock in a forest clearing, and several beneath an abandoned native beehive.

On September 30, at "Mutulambo" (? Maulambo) Forest edge, six eggs under logs. The range of measurements for the 19 eggs taken in the Misuku Mountains is 6.5 x 7, 6.5 x 7.5, 7 x 7.5, 7 x 8, and 7.5 x 8 mm. In size the eggs of *L. a. angularis* are barely distinguishable from those of *H. gardineri* for each egg is separate and distinct, unlike those of *L. capensis* which are cemented in pairs.

On December 3, the discovery of an egg 8 mm. in diameter on a leaf-strewn game trail leading through *Brachystegia* woodland on a slope below the forest, was the first intimation of the presence of this species on Nchisi Mountain.

Enemies. Remains of one *angularis* were recovered from the stomach of a *Thelotornis k. capensis* on Cholo Mountain.

Habitat. This montane species occurs at altitudes ranging from about 2500 to 6500 feet. Though arboreal it is adaptive, dwelling on tree trunks in virgin evergreen forest as well as in *Brachystegia* woodlands or upon the smooth boles of introduced blue gums. Several lived on the walls of Chiradzulu Boma, retiring to the thatched roof; the specimen from Mlanje was shot on the galvanized iron wall of the Power Station in Ruo Valley Forest.

Lygodactylus picturatus picturatus (Peters)

Hemidactylus picturatus Peters, 1870b, Monatsb. Akad. Wiss. Berlin, p. 115: *nom. nov.* for *variegatus* Peters, 1868a, preoccupied.

11 ♂♂, 10 ♀♀ (M.C.Z. 50441–9) near Tete. 8–15.i.49.

Records. Not known from Nyasaland, and previously unknown from Mozambique. In view of Peters having made extensive collections around Tete in 1854 it is almost certain that this common East African species has been introduced since that time. As I (1947a, p. 237) have pointed out, its transportation by human agency, either as egg or adult, has carried it along rivers and railways.

Native name of Yellow-throated Gecko. *Bunyangururu* (Nyungwe, being distinguished from *L. capensis* in the same locality and collected at Tete by Peters).

Variation. Within the range given in my revision (1947a, p. 200).

Color. While in the largest males the chin and throat are wholly black, those of the younger males exhibit a black chevron following the contour of the lower jaw; within this is a solid black marking shaped like a spearhead whose apex points towards the chin while its base is produced posteriorly into three projecting prongs.

Size. Largest ♂ (M.C.Z. 50441), 80 (39 + 41) mm.; largest ♀ (M.C.Z. 50446), 65 (34 + 31) mm.

Habitat. On mopane trees along the banks of the Zambezi River.

Afroedura transvaalica ? transvaalica (Hewitt)

Oedura transvaalica Hewitt, 1925b, Rec. Albany Mus., **3**, p. 350, pl. xvi, fig. 1, pl. xvii, fig. 1: Njelele River, Zoutpansberg District, Transvaal.
Afroedura transvaalica transvaalica Loveridge, 1947a, p. 267.

♂ (M.C.Z. 50450) Kasumbadedza near Tete. 28.i.49.

Records. Unknown from Nyasaland where it should be looked for at dusk along the edges of cracks in rocky outcrops, especially among granitic boulders subject to sunsplit flaking and fissuring. Search should be made near the Mpatamanga Gorge and possibly on rocky hills as far north as southeast Lake Nyasa where associated lizards are known to occur.

Until now the most northerly record for *Afroedura* in the east has been Musami, near Salisbury, Southern Rhodesia ("Northern" Rhodesia in my (1947a, p. 258) key is a lapsus), besides which *t.*

transvaalica is known only from Empandeni, S. R. and the type locality on the northern border of the Transvaal.

Variation. Rostral *widely separated* from the nostril, in which respect this Tete specimen differs from all known *t. transvaalica* and *t. platyceps* (Hewitt). As, however, this character is known to vary in *nivaria* and *tembulica*, description of a new subspecies on the basis of a single character in a single specimen appears unjustified. Exclusion of the rostral from the nostril is characteristic of *A. k. karroica* and its subspecies, but the Tete gecko cannot be referred to *karroica* on account of the more numerous scales in its caudal verticils.

No internasal granules; nostril surrounded by 3 nasals and the first labial; upper labials 9; lower labials 9; ventrals *subhexagonal*, *subimbricate;* caudal verticils with 7–8 scales above, 6 below; preanal pores 8.

Size. Total length 101 (52 + 49) mm.

Habitat. For almost four weeks I had been collecting at Kasumbadedza when this perfect *Afrocdura* was secured almost by accident. After devoting much of the day to packing in preparation for our departure, I paid a last visit to Mwanza rocks in the hope of securing one or two more topotypes of *Platysaurus t. torquatus*. In the rays of the setting sun one was basking beside a thin flaking of rock on a huge granitic boulder by the banks of the Zambezi. I fired and the lizard vanished completely. My gunbearer and I searched assiduously, but in vain. Assuming the reptile must have slipped beneath the huge rock flake, I sent for a stout, six-foot crowbar and after much effort broke away the flake exposing the bewildered *Afrocdura* upon which I pounced with a piece of cotton cloth, then transferred it to a cyanide killing bottle. Though in color and size this gecko resembled a *Hemidactylus mabouia*, its extraordinary flattened body and tail immediately proclaimed it as an *Afrocdura* whose "habit" is an adaptation to its very specialized habitat.

Pachydactylus punctatus punctatus Peters

Pachydactylus punctatus Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 615: Sena and Tete, Mozambique.

4 ♂♂, 4 ♀♀, 6 yng. (M.C.Z. 50451–9) near Tete. 12–13.i.49.

Records. Not known from Nyasaland.

Native name. Kasakwi (Nyungwe).

Variation. No internasal granules; nostril surrounded by 3 nasals

(10 ex.) and first labial (4 ex.); upper labials 7–9; lower labials 6–8; no dorsal tubercles; tubercles on either side of tail 2–4, upstanding and conspicuous in males, merely enlarged flat scales in females.

Color. The brown-edged, silvery-white spots on the head and back of the very smallest geckos give rise to the numerous brown flecks (rather than spots) of the adult.

Size. Largest ♂ (M.C.Z. 50451), 62+ (35 + 27+) mm.; largest ♀ (M.C.Z. 50452), 71+ (38 + 33+) mm.

Breeding. On or about January 13, some eggs, approximately 7 x 9 mm. in size, were found beneath drifted debris in a dry watercourse. The shells of two crumbled away as they contained embryos (preserved); another hatched a gecko (M.C.Z. 50459) measuring 40 (20 + 20) mm.

Habitat. After searching in vain for these small geckos beneath boulders and logs, I accidently found them living in a ruinous mud-brick wall not fifty yards from my tent. Against the base of the wall dead leaves had drifted and as I passed by I heard a faint rustle among them. An adult *punctatus* had run towards a hole in the base of the wall outside which it paused. Shining my flashlight in its eyes I picked it up with the forceps. Returning with my gunbearer to hold a cyanide bottle, I caught six more, three of them close together. Subsequently several were found in a rotten log that we demolished; none was brought in by natives.

Pachydactylus capensis oshaughnessyi Boulenger

Pachydactylus oshaughnessyi Boulenger, 1885d, Cat. Lizards Brit. Mus., **1**, p. 204, pl. xvi, fig. 3: Lake Nyasa, Nyasaland. Boulenger, 1891a, p. 306.
Pachydactylus capensis oshaughnessyi Loveridge, 1947a, p. 387.

Records. "Lake Nyassa" (B). After failing to find this species in Nyasaland, I took the opportunity of examining the cotypes in the British Museum whose data is as follows:
No. (18) 77.7.2.15, renumbered 1946.8.22.68, young example from Cape Maclear. A. A. Simons coll. Purchased from same.
No. (18) 77.11.5.1, renumbered 1946.8.22.69, adult from Lake Nyasa Col. B. Thelwall coll. Purchased from Mr. Higgins.

Had I known before that one of the cotypes came from Cape Maclear I would have tried to visit the peninsula which appears to harbor several species of reptiles that have not been taken elsewhere in Nyasaland.

Variation. The enlarged dorsal tubercles of these cotypes described by Boulenger as "arranged rather irregularly," and consequently placed in that section of my key (1947a, p. 342, sect. 21) might just as well be said to "form more or less regular longitudinal rows," a point that can best be settled when more material is available.

Color. The striking pattern in both cotypes consists of one dark-edged whitish crescent on nape, two on the back, and seven on the tail of the young, that of the adult being lost.

Pachydactylus bibronii turneri (Gray)

Homodactylus turneri Gray, 1864e, Proc. Zool. Soc. London, p. 59, pl. ix, fig. 2: "South East Africa," i.e. Tete, Mozambique.

Pachydactylus bibroni turneri Parker, 1936c, p. 129; Loveridge, 1947a, pp. 405–409.

Pachydactylus bibroni Mitchell, 1946, p. 22.

1 (A.M.N.H. 67832) Kasungu. 19–23.viii.46.
8 (M.C.Z. 50460–6) Chitala River. 14–18.xii.48.
2 (M.C.Z. 50467–8) near Tete. 13–22.i.49.

Records. These are the first *definite* locality records for Nyasaland. However, according to Mitchell's ms. it also occurs at Blantyre; Chikwawa; Chiromo; Fort Johnston; Monkey Bay; Port Herald and Zomba.

Native name of Zambezi Gecko. *Sinuda* (Nyungwe).

Variation. No internasal granules; nostril surrounded by 3 nasals; upper labials 9–10; lower labials 6–8; dorsal tubercles in 16–19 rows; postanal tubercles on either side of tail 3–4.

Size. Largest ♂ (M.C.Z. 50462), 165+ (94 + 71+) mm., tail regenerating.

Breeding. Nothing has been recorded regarding the breeding habits of either this race or the South African *bibronii*.

Enemies. At Tete the undigested tails of two Zambezi Geckos were removed from the stomach of a Spotted Wood-Snake (*Philothamnus s. semivariegatus*); the geckos themselves evidently had escaped. The undigested skin of another was recovered from the intestine of a Tiger Snake (*Telescopus s. semiannulatus*).

Temperament. Surprisingly enough, these big geckos seem to be both gentle and sociable, several gathering nightly on the wall around a projecting electric light. I was able to seize them quite easily by shining my torch in their eyes as I did so. Two others shared a room

with a large, though less robust, *Hemidactylus mabouia* but kept to different walls. Though *mabouia* is an aggressive species in my experience, this one showed no inclination to interfere with its big neighbours.

Habitat. I shot one of the Tete topotypes on the trunk of a baobab; the other was brought me by a Kasumbadedza villager who said he had caught it on the wall of his hut. The Chitala series were from European houses.

Pachydactylus tetensis sp. nov.
Plate 5, figure 3

Type. M.C.Z. No. 50469, an adult male from Mwanza rocks on the south bank of the Zambezi River between Kasumbadedza Village and Tete, Mozambique. Collected by Arthur Loveridge, January 22, 1949.

Paratype. M.C.Z. No. 51753, an adult male from Lungsole River, southeastern Tanganyika Territory. Collected by C. J. P. Ionides, March 29, 1948.

Diagnosis. Apparently directly descended from *P. tuberculosus* of Equatorial Africa, with which it agrees in differing from all other forty members of the genus in possessing preanal pores; probably ancestral to *namaquensis* of Southwest Africa with which it agrees in its unusual rostral and swollen nasal ring. Runs down rapidly and correctly to section 40 of my key to the genus (1947a, p. 344).

Description. (Paratype variations in parentheses.) Snout obtuse, prominent; rostral without median groove but with an upward projection entering the greatly (slightly) swollen nasal ring which also comprises 3 (4) nasals and the first labial (excluded); internasal granule 1; granules on snout subconical, keeled, slightly larger than those on occiput, which are intermixed with larger, round, smooth, or rarely stellate tubercles; cheeks swollen; ear-opening moderate, vertically oval; upper labials 11–11 (13–13); lower labials 8–8 (10–10); mental as broad as the adjacent labials; gulars small, flat, imbricate.

Body and lower flanks covered with small, unequal, smooth or feebly striate, juxtaposed granules intermixed with larger, subconical, keeled and stellate tubercles (across back and flanks about 26 (24)) which are so numerous and juxtaposed in the dorso-lateral region as to almost exclude any granules, but form 4 fairly regular longitudinal rows on either side of the vertebral line which is covered by granules or very small tubercles that form a longitudinal band 4 to 5 granules in width;

ventral scales intermediate in size between the dorsal granules and enlarged tubercles; preanal pores in male 13 (12); a pair of tiny postanal slits present, but only one, scarcely recognizable, tooth-like tubercle on base of tail; limbs moderate, stout, the adpressed hind limb reaching beyond the elbow; digits moderately long and slender, more strongly dilated at apex than at base; scansors under first toe 9 + 5 (7) transverse scutes on basal portion, scansors under fourth toe 13 + 8 (12 + 9) transverse scutes on basal portion.

Tail depressed, verticillate, tapering, covered above with small, stellate, juxtaposed, subgranular scales with a pair of pointed, stellate tubercles on either side of the middle line and a third placed laterally at the posterior end of each verticil; below with large, irregular, smooth, imbricate scales of which the median series, except on basal portion, are transversely enlarged (on regenerated half of tail occupying the entire lower surface like subcaudals in an ophidian).

Color in formalin. Above, pale gray, some tubercles paler, others black suggesting obsolescent dark wavy crossbars. Below, pinkish white.

Size. Total length of ♂ holotype, 169 (82 + 87) mm., but the posterior half of the finely tapering tail is regenerated; exceeded by ♂ paratype, 192 (99 + 93) mm., whose tail is also regenerated.

Habitat. Shot at dusk beside a fissure of a rock, a position protected by a shrub that was growing against the rock.

AGAMIDAE

Agama cyanogaster (Rüppell)

Stellio cyanogaster Rüppell, 1835, Neue Wirbelthiere Fauna Abess. Amph., p. 10, pl. v: Massaua, Eritrea.

Agama atricollis A. Smith, 1849, Illus. Zool. S. Africa, Rept., p. 14: Natal, South Africa. Günther, 1893 (1892), p. 555; Johnston, 1897 and 1898, p. 361; Mitchell, 1946, pp. 23, 41.

♂ (A.M.N.H. 67815) Chibotela. 24.viii–8.ix.46.
2 ♂♂, 4 ♀♀ (M.C.Z. 50538–43) Chire R. Bridge, N.R. 21.x.48.
2 ♂♂, ♀ (M.C.Z. 50544–6) Chitala River. 15.xii.48.
2 ♀♀ (M.C.Z. 50547–8) Nchisi Mtn. 29.xi & 2.xii.48.
♂ & juv. (M.C.Z. 50549–50) Zomba Plateau. 9.ix.48.
♂ (M.C.Z. 50551) Cholo Mtn. 17.iii.48.
♂, ♀ (M.C.Z. 50552–3) Likabula River. 31.vii.48.

Records. Blantyre (M. ms.); Shire Highlands, principally Zomba and Mlanje Mtns. (G).

Native names of Black-necked Tree-Agama. *Chikungwe* (Manganja); *guro* (Chewa; Ngoni). Mitchell gives *nampopo* as the Yao name for this species, but it was supplied to me for *A. m. mossambica* which has also a blue head.

Variation. It is surprising how many characters this, the most distinctive of Nyasaland agamas, has in common with the other three. Back usually without vertebral crest, though a concentration of enlarged keeled scales may form a ribbon-like band in the vertebral region from nape to base of tail and sometimes give rise to a low nuchal crest; midbody scales 100–133; preanal pores in adult males in two rows totaling 19–24, in females in a single row 8–11.

Color in life. Juv. 135 mm. ♀ (M.C.Z. 50550). Above, head plumbeous faintly flecked with black; back and flanks blotched black and gray, the enlarged scales creamy white, limbs chiefly gray with black flecks; tail gray with ten black crossbars 2 to 8 scales in breadth. Below, throat faintly yellowish white vermiculated with satiny pale blue; rest of underparts white, some indistinct dusky markings on chest and sides of belly and dark bars indicated towards end of tail. So closely did this agama resemble a patch of lichen on the tree trunk where it was sunning, that I could not distinguish it until it moved.

A gravid, 203 mm. ♀ (M.C.Z. 50548) sunning on a lichen-covered branch of acacia, showed no blue until after death.

Halfgrown, 228 mm. ♀ (M.C.Z. 50551). Above, crown and sides of head pale blue; back, flanks, and hind limbs flecked with creamy white (on enlarged scales); shoulders pale blue but rest of forelimb black, flecked and crossed with white; tail like back but the black tending to form crossbars particularly towards the tip where are well-defined black bands 6 to 8 scales in breadth. Below, throat gray to blackish but so heavily overlaid with pale blue vermiculations as to appear blue; rest of underparts white conspicuously flecked with black.

Gravid, 258 mm. ♀ (M.C.Z. 50547), basking on bole of tree, was very dark all over, and neither changed color nor moved when shot dead through the head.

Adult, 291 mm. ♂ (M.C.Z. 50549). Above, head turquoise blue; body and limbs cream peppered with black; tail gray, some blue towards tip. Below, chin and throat blue; chest, belly, and limbs cream sparsely flecked with black; tail for first 10 mm. behind anus

white, then darker for 10 mm., the rest straw color with only faint indications of barring.

Wide variation in the rich blue coloring was displayed by the six adults shot on adjacent trees surrounding Chire River rest house.

Size. Largest ♂ (M.C.Z. 50544), 389 (167 + 231) mm., being substantially the same as the Tanganyika record ♂ (M.C.Z. 18283) which measured 405 (165 + 240) mm. in the flesh in 1921, but is now only 385 (155 + 230) mm. Largest ♀ (A.M.N.H. 67815), 287 (127 + 160) mm.

Breeding. On July 31 a ♀ held very small ova.

On October	21	"	"	round ova only 6 mm. in diameter.
On November	29	"	"	8 eggs measuring about 13 x 24 mm.
On December	2	"	"	3 or more " " 12 x 18 mm.
On December	15	"	"	13 eggs " " 16 x 23 mm.

The last lot appeared ready for laying. The last three lizards listed also had a second set of fertilized ova developing. Testes of the ♂ taken on September 9, were very large.

Diet. This Zomba ♂ had, in addition to many ants, an "inedible" grasshopper of the genus *Phymateus* in its stomach; while an Nchisi ♀ held two very large caterpillars; other stomach contents have been identified for me by Dr. W. L. Brown as follows: — The Chire River stomachs consisted almost exclusively of workers, with only a few soldiers, of a small species of *Pheidole;* there were also fragments of a large ponerine, while *Camponotus, Cataulacus, Paratrechina* (?), *Tetramorium* and *Tetraponera* were each represented by a few ants. Of beetles there were only the elytra of a few small species; there were parts of a bee and other hymenoptera; also the unidentifiable remains of an adult hemipteron. The Chitala River agamas had been feeding chiefly on *Polyrhachis* sp., some unidentifiable ponerines, and a few ants referable to *Brachyponera, Tetraponera,* and *Pheidole.* In addition there was a curculionid beetle and some coleopterous larvae.

Parasites. Worms (*Abbreviata* sp., probably *polydentata*) were present in the Chire River agamas, while others, viz. *Abbreviata* spp., probably *polydentata* and *variani* together with fragmentary filarioids, probably *Foleyella* sp., were recovered from the two Nchisi lizards; and *Abbreviata amaniensis* and *variani;* a female fragment probably *Foleyella* sp.; and larvae, probably *Spiura* sp.; and a ♀, probably *Thelandros* sp., were in the Chitala River specimens. I am indebted to Mr. J. T. Lucker for these identifications.

Agama hispida armata Peters

Agama armata Peters, 1854, Ber. Akad. Wiss. Berlin, p. 616: Sena and Tete, Mozambique. Boulenger, 1897e, p. 800; Johnston, 1898, p. 361.
Agama hispida Mitchell (not of Linné), 1946, pp. 23, 41.

♂, juv. (A.M.N.H. 67845–6) Bua River. 30.vii–1.viii.46.
3 ♂♂, 2 ♀♀, 6 juv. (A.M.N.H. 67826–30) Kasungu. 19–23.viii.46.
♀ (A.M.N.H. 67812) Likabula River. 19.vi–18.vii.46.
♂ (M.C.Z. 50546) Chitala River. 16.xii.48.
♂ (M.C.Z. 50490) Mtimbuka. 28.ii.49.
10 ♂♂, 12 ♀♀ (M.C.Z. 50470–89) near Tete. 6–28.i.49.

Records. Misuku Mountains (B); "Nyika Plateau" (B). These records must surely refer to the arid, rocky slopes at lower levels, rather than from 6,000 to 7,000 feet given by Boulenger.

Native names of Zambezi Spiny Agama. *Cigonamatala* (Yao); *dududu* (Nyanja); *tokwe* (Nyungwe).

Variation. Midbody scale rows 72–90; keels on the vertebral series of scales form a low serration in males and sometimes in females, though not in M.C.Z. 50481–2 and 50487–8; ventrals more or less obtusely keeled (quite or almost smooth in the Chitala and Mtimbuka males); fifth toe *usually* (not in M.C.Z. 50486 only) extending as far as first; preanal pores in males 10–14.

Color in life. ♂ (M.C.Z. 50490). Above, crown of head gray but anteriorly, posteriorly, and especially on sides, light blue; back dark gray except for a whitish vertebral band on either side of which are four pairs of blackish blotches; tail gray indistinctly barred with darker. Below, throat grayish, rest of undersurface more or less white darkening on limbs and tail.

Neither this coloration, nor that furnished by Peters (1882a, pl. vii, fig. 2), resemble the cryptic sandy-rufous coloring of the series of Tete topotypes. Unfortunately I neglected to record this in the field as I (1923h, pp. 942–3) had already done so for Tanganyika specimens of both male and female, though under the wrong subspecific name. See remarks below under *Temperament.*

Size. Largest ♂ (M.C.Z. 50470), 241+ (93 + 148+) mm.; largest ♀ (M.C.Z. 50480), 246 (92 + 154) mm., though surpassed 2 mm. in body length by another with truncated tail.

Breeding. Testes of Chitala ♂ very much enlarged. All twelve Tete females are bloated and undoubtedly gravid; five examined held from 12 to 20 eggs ranging from about 8 mm. in diameter to others

measuring 9 x 13 mm. and apparently ready for laying. The monsoon rains were expected daily.

Diet. Stomach contents of five Tete females have been identified and summarized for me by Dr. W. L. Brown as follows: Hymenoptera of family Formicidae — half to three-quarters of the stomach contents of each agama consisted of *Camponotus* spp. females; *Tetramorium* sp. females were numerous; *Pheidole* sp. minor workers plentiful; *Crematogaster* spp. present; and a few other undetermined genera of Cerapachyine, Myrmicine, and Ponerine affinities. Coleoptera remains consisted chiefly of broken elytra, in addition two damaged beetles referable to the Staphylinidae and Tenebrionidae. Hemiptera — remains of heteroptera are apparently all representatives of one species. Orthoptera — the head and legs of a small mantis nymph.

Parasites. Mites (*Pterygosoma ? aculeatum*) on Mtimbuka male. Worms (*Polydelphis* sp. ♀ ; *Strongyluris* sp. ♀ ; *Thelandros* sp. ♀ ; a *Thubunaea*, probably *agamae;* and a cestode (*Oochoristica* sp.), the last mentioned having been determined by Mr. Allen McIntosh.

Temperament. These agamas, irrespective of sex, rely to such an extent on their cryptic coloration harmonizing with their environment of reddish rock and sand as to convey the impression of being extremely lethargic, quite belied by the bursts of speed of which they are capable. The following notes are quoted in illustration.

"At 6 a.m. this morning, the temperature being 80°, I paused to put cotton wool in the mouth of a bird I had just shot. The wool for this operation was being held out as required by an African who was carrying my haversack. As I handed him the bird and was about to turn away, he remarked: "What about this?" indicating an agama lying right between our feet. I had entirely failed to notice it, so closely did the lizard's coloring approximate to the sandy ground on which it was resting. Only when I picked it up did this gravid female show any signs of life. (Kasumbadedza, 6.i.49).

"About 5 p.m., the temperature being around 90°, my gunbearer invited attention to a motionless male agama whose forward half was upraised against a stone. It was so close I had to retreat a further six feet or so before firing at it with dust shot, when, still motionless, it fell over dead with a bullet through the brain" (Kasumbadedza, 12.i.49).

Agama mossambica mossambica Peters

Agama mossambica Peters, 1854, Ber. Akad. Wiss. Berlin, p. 616: Coast of

Mozambique between 7° and 20° S. latitude. Günther, 1893 (1892), p. 555; Johnston, 1897 and 1898, p. 361.

3 ♂♂, 3 ♀♀, 4 juv. (M.C.Z. 50507–16) Likabula River. 29–31.vii.48.
6 ♂♂, 9 ♀♀, 3 juv. (M.C.Z. 50520–37) Ruo River. 1–8.iv.49.

Records. Shire Highlands, principally Mlanje and Zomba Mtns. (G).

Native names of Mozambique Tree-Agama. *Nalimata* (Nyanja); *nampopo* (Yao, but applied to *cyanogaster* according to Mitchell).

Variation. Midbody scale rows 72–94 (69–85 in type series, *fide* Peters); keels on the vertebral series of scales form a nuchal and usually a very low vertebral crest though sometimes scarcely discernible in females; ventrals subequal to dorsals, obtusely or even strongly keeled and mucronate; fourth toe scarcely (M.C.Z. 50512 only) or slightly longer than the third, fifth toe usually extending (sometimes scarcely as on right foot of M.C.Z. 50510) a full claw length beyond the first; preanal pores in males 10–14, often indistinct.

Color in life. ♂. Above, crown of head, around eyes, and upper lip bronze, rest of head ultramarine; back blackish except in vicinity of vertebral crest which is light metallic green, dorso-lateral region, flanks, and limbs flecked with fawn; otherwise limbs blackish, feet lighter; tail gray with fourteen indistinct crossbands (Likabula River, 31.vii.48).

Unfortunately the coloring of the underside was not recorded, but it lacked the brick red band across the throat found in the form described as *montana* Barbour & Loveridge, which re-examination reveals should be regarded as a distinct species, a matter with which I hope to deal at a future date.

Size. Largest Likabula ♂ (M.C.Z. 50507), 254 (93 + 161) mm.; largest Likabula ♀ (M.C.Z. 50509), 185 (70 + 115) mm.; largest Ruo ♂ (M.C.Z. 50520), 173 (66 + 107) mm.; largest Ruo ♀ (M.C.Z. 50524), 181 (68 + 113) mm.

Breeding. No sign of developing eggs in the ♀♀ examined.

Parasites. Orange-colored mites (*Pterogosoma triangulare; Schongastia gerhosauri; Trombicula montensis*) are numerous in the deep pockets of the gular fold anterior to the black spot on shoulder; in one stomach was an insect parasite (*Mermithoidea*) presumably ingested by the lizard, while nematodes (*Abbreviata amaniensis; A.* sp., probably *polydentata*) were recovered from several stomachs. In an *Agama m. mossambica* from Liwale, Tanganyika Territory, used for comparative purposes, three species of *Abbreviata*, probably

amaniensis, *polydentata* and *varani*, were present.

Habitat. On the morning of April 8, not far from the Ruo River, eleven ♀♀ and young were shot as they basked on the trunks of small trees in a streamside area that was being cleared of underbrush.

Agama kirkii kirkii Boulenger

Agama kirkii Boulenger, 1885d, Cat. Lizards Brit. Mus., **1**, p. 354, pl. xxviii, fig. 2: Zambesi Expedition. Günther, 1893 (1892), p. 555; Bocage, 1896a, p. 103; Johnston, 1897 and 1898, p. 361; Mitchell, 1946, p. 23.

♀, juv. (M.C.Z. 50505–6) Mtimbuka. 16.ii.49.
♂ (M.C.Z. 50491) near Mpatamanga Gorge. 31.i.49.
juv. (M.C.Z. 50492) Chiradzulu Mtn. 27.viii.48.
5 ♂♂, 4 ♀♀, 3 juv. (M.C.Z. 50493–504) Likabula R. 29–31.vii.48.
3 hgr. ♂♂ (M.C.Z. 50517–9) Ruo River. i.iv.49.

Records. Blantyre (M); Shire Highlands (G); Zomba (M). Johnston (1898, p. 356) is referring to *A. kirkii* when he writes of "*colonorum* or a closely related species," but his description is that of the West African lizard.

Variation. Midbody scale rows 98–118 (99 in holotype); nuchal and vertebral crests well developed; ventrals subequal to dorsals, smooth or obtusely keeled and mucronate; fourth toe very slightly longer than third, fifth toe extending a full claw length beyond the first, preanal pores in males 11–16, distinct.

Color in life. ♂ (M.C.Z. 50493). Above, crown of head brown and brick red, lores and around eyes orange red; nape orange red flecked with yellow; vertebral crest white with scattered white scales on either side of it; dorso-lateral region dark bluish black turning paler on flanks as it merges into the belly coloring; upper arm pale blue, lower darker; hind limbs and tail greenish flecked with black, the latter with more than a score of narrow (one-scale wide) white annuli around its posterior two-thirds. Below, throat brownish orange to orange red flecked and streaked with cream in a series of longitudinal lines enclosing a dark navy-blue basal patch of variable shape; breast ultramarine flecked with white fading to grayish blue in centre of belly; limbs bluish to whitish, soles of feet white; tail greenish showing light annuli.

In the three halfgrown ♂♂ (57–65 mm. from snout to anus) the throat is predominantly white with dusky lines that are continued over breast and belly.

Largest ♀ (M.C.Z. 50505). Above, crown of head mixed brown and pale blue, beneath eyes brown but upper lip blue; nape and back with four broad, bright red, hollow-centred crossbars which coalesce on flanks to form a reddish network; back, limbs, and tail lemon yellow, the latter with about a dozen crossbars, end of tail dark. Below, dirty white, some pale blue on edges of jaws, several longitudinal dusky lines and a dusky basal patch on throat.

This agama, when shot, was various shades of dark brown in harmony with the tree trunk on which it was basking about 10 a.m.; it assumed the handsome coloring noted above soon after death. The young juvenile was one of several all-brown ones seen running about the rocks adjacent to the tree.

Size. Largest ♂ (M.C.Z. 50491), 315 (105 + 210) mm.; largest ♀ (M.C.Z. 50505), 242 (92 + 150) mm.; smallest (M.C.Z. 50506), 96 (36 + 60) mm. Head and body length included in that of complete tails (1.5–1.7 times in juveniles, 1.6–1.7 in ♀ ♀, 1.6–2.0 in ♂ ♂).

Breeding. On February 16 the large ♀ held very small ova.
On July 29–31 all three ♀ ♀ held very small ova.

Diet. Examination of the stomachs of several Likabula River agamas by Dr. W. L. Brown, revealed that termites (workers, soldiers and sexual castes) were the chief food, with a few fragmentary ants of the genera *Pheidole, Tetramorium* and an unidentified dolichoderine genus present, besides a small acridioid grasshopper and a number of small hemipterans. The stomach of the Mtimbuka female was distended with large black ants.

Parasites. Red Mites (*Pterygosoma aculeatum*) were numerous along either side of the breast and belly of the Mtimbuka ♀, and nematodes (*Abbreviata amaniensis; A.* sp., probably *polydentata; Strongyluris* sp., probably *brevicauda*) were recovered from Likabula River lizards.

Habitat. All were on rocks or boulders with the exception of the Mtimbuka ♀, which was on a tree trunk.

CHAMAELEONIDAE

Chamaeleo dilepis isabellinus Günther

Chamaeleon isabellinus Günther, 1893 (1892), Proc. Zool. Soc. London, p. 556, pl. xxxiii, fig. 2: Shire Highlands, Nyasaland. Bocage, 1896a, p. 103; Johnston, 1897, p. 361; 1898, p. 361a; Monk, 1903, p. 323.

♀ (A.M.N.H. 67806) Likabula R. 19.viii–18.ix.46.
2 ♂♂, 3 ♀♀, 3 juv. (M.C.Z. 50630–7) Likabula R. 27–31.vii.48.
♀ (M.C.Z. 50638) Ruo River. 8.iv.49.
2 ♀♀, 1 juv. (M.C.Z. 50639–41) Cholo Mtn. 11.iii.49.

Records. Parker (1942, p. 79) has recently clarified the position of this race by revealing that the Somaliland form *C. d. ruspolii* Boettger, is not synonymous with *isabellinus* as was stated by Boettger in 1893, but perfectly distinguishable.

Lönnberg's (1911, p. 19) record from Meru Boma in Kenya Colony, is probably in the same category as the individuals from Dodoma and Gulwe, Tanganyika Territory, which I (1920a, p. 163) referred with a query to *isabellinus*. Re-examination shows these isolated examples to be more or less indistinguishable from *isabellinus*, but the series of Dodoma chameleons secured subsequently (1928d, pp. 66–67), by their large size approach in appearance those here referred to *petersii*. The entire group is in much need of painstaking study, but their variability is such as to make the task of reducing them to readily recognizable races appear almost hopeless.

Variation. Dermal lobe with 4–5 scales, including small marginals, in a horizontal series; hind feet of both males exhibit, though somewhat indistinctly, the so-called dermal spurs.

Size. Larger ♂ (M.C.Z. 50630), 142 (71 + 71) mm.; largest ♀ (M.C.Z. 50640), 276 (137 + 139) mm.

Breeding. On March 11, at Cholo, both adult ♀♀ appeared spent. On April 8, at Ruo, the only ♀ held 36 eggs measuring *ca.* 12 x 7 mm. Between July 27–31 and again from mid-August to mid-September, at Likabula River, a total of four ♀♀ held small ova.

Diet. A green shield bug and three large green caterpillars in the stomach of a Likabula specimen.

Enemies. Two recovered from stomachs of Cape Vine-Snakes (*Thelotornis k. capensis*) at Cholo.

Chamaeleo dilepis dilepis Leach

Chamaeleo dilepis Leach, 1819, in Bowdich, Miss. Ashantee, App. p. 493: French Congo (Gabon). Mitchell (part), 1946, pp. 25, 41.
Chamaeleon dilepis var. *parvilobus* Günther (not Boulenger), 1893 (1892), pp. 555.
Chamaeleon quilensis Bocage (not Bocage, 1866), 1896a, p. 103.
Chamaeleon dilepis Boulenger, 1897e, p. 800; Johnston, 1897 and 1898, p. 361.
Chameleon ? sp. Benson, 1949, Ann. Transvaal Mus., **21**, p. 160.

♂, 6 ♀ ♀ (A.M.N.H. 67816–22) Chibotela. 24.viii–8.ix.46.
3 ♂♂, ♀ (A.M.N.H. 67841–4) Nchisi Mtn. 23.vii–13.ix.46.
15 ♂♂, 20 ♀ ♀ (M.C.Z. 50557–91) Misuku Mtns. 24–30.ix.48.
4 ♀ ♀ (M.C.Z. 50592–5) Nchenachena. 20.xi.48.
♀ (M.C.Z. 50596) Mzimba. 23.xi.48.
5 ♂♂, 3 ♀ ♀ (M.C.Z. 50597–604) Nchisi Mtn. 1–8.xii.48.

Records. Fort Hill (B); Karonga to Kondowe (B); Misuku Mtns. (as Masuku Plateau, B); Nkata Bay to Ruarwe (B); Nyika Plateau (B); Shire Highlands (G). Perhaps this last should be excluded though it is listed in the same paper in which *isabellinus* is described.

Native names of the Flap-necked Chameleon. *Bilimankwa* (Chewa; Ngoni); *nazikambi* (Manganja; Nyanja) corroborating those given by Mitchell (1946, p. 41) though with variations in spelling; *nifwi* (Misuku).

Variation. C. parvilobus Boulenger (1887a, p. 449, pl. xxxix, figs. 5–5a) is a synonym of *C. d. quilensis* Bocage, and I have previously (1936j, p. 332) pointed out that the dermal lobes of immature *C. d. dilepis* appear indistinguishable from those of adult *quilensis*. Many of the younger chameleons listed above might well be identified as *C. d. quilensis*, and I imagine that this is what led Günther (1893, p. 555) to record *parvilobus* from Nyasaland.

Dermal lobe with 6–8 scales, including small marginals, in a horizontal series; hind feet of all twenty-five males exhibit so-called dermal spurs, lacking in females, all of which have been sexed by dissection.

Size. Largest ♂ (M.C.Z. 50600), 195 (105 + 90) mm.; largest ♀ (M.C.Z. 50596), 276 (150 + 126) mm. Smallest juvenile, a ♂ (M.C.Z. 50570), 109 (60 + 49) mm.

It is quite possible that the four largest females (120–127 + 97–124 mm.) in the Misuku Mountain series, were brought up from lower altitudes, and that the 14 ♂♂ (60–93 + 49–85 mm.) and remaining 15 ♀ ♀ (72–107 + 62–98 mm.) represent the dwarfing effect of life at higher altitudes with consequently lower temperatures. The rest of the series come from altitudes ranging from 1700–4500 feet.

Breeding. During Sept. 24–30 the ova of 20 ♀ ♀ were undeveloped.
On Nov. 23 the ova of one ♀ measured 6 mm.
Between Dec. 1–8 the ova of two ♀ ♀ were undeveloped, while that of a third measured about 4 mm. in diameter. In this week the testes of all males taken were much swollen.

Enemies. Probably it was this common and widely distributed form that in 1949, Benson mentions finding in the stomach of a

South African Cuckoo-falcon (*Aviceda cuculoides verreauxi* at Mpata. One was recovered from the stomach of a Vine-Snake (*Thelotornis k. capensis*) in the Misuku Mountains; at Mzimba a large female fell from a tree together with a Boomslang (*Dispholidus typus*) to whose poison it succumbed; two other large chameleons had been swallowed by Boomslangs at Nchisi on December 8 and 10.

Chamaeleo dilepis petersii Gray

Chamaeleon petersii Gray, 1864, Proc. Zool. Soc. London, p. 470: Mozambique.
Chamaeleon dilepis Günther, 1894a (1893), p. 618.
Chamaeleo dilepis Mitchell (part), 1946, p. 25.

2 ♀♀ (M.C.Z. 50605–6) Chitala R. 14.xii.48.
7 ♂♂, 4 ♀♀, 1 juv. (M.C.Z. 50607–18) Mtimbuka. 7–17.ii.49.
10 ♂♂ (M.C.Z. 50620–9) near Tete. 12–25.i.49.

Records. Presumably the Chikwawa chameleon seen twenty feet up a tree by Mitchell (1946, p. 25), who estimated its length at 14 inches, belongs to this form. Even if his estimate is correct, however, it does not constitute a record, for a ♂ and ♀ from Morogoro, Tanganyika Territory, measuring $13\frac{3}{8}$ and $14\frac{1}{2}$ inches respectively, were recorded many years ago by me (1920a, p. 161), and larger ones since.

Native names of the Giant Flap-necked Chameleon. *Naluwi* (Yao); *dwidwi* (Nyungwe).

Variation. Dermal lobe with 6–7 scales, including small marginals, in a horizontal series; except in M.C.Z. 50616 and 50625 where it is 4–5 and 5 respectively; hind feet of all males exhibit so-called dermal spurs, though sometimes very indistinctly developed.

I employ the name *petersii* for these huge chameleons from the hot lowlands at altitudes ranging from 250 to 1,550 feet, as it seems impossible to regard them as subspecifically identical with the smaller reptiles of the uplands. Yet separation on size alone is likely to create difficulties, for from Mbanja, north of Lindi, I have recorded a ♀ of 390 mm., and one of 370 mm. from Morogoro. Moreover at Mbanja there appeared to be a colony of the giant form surrounded by those of more moderate dimensions.

Size. Largest ♂ (M.C.Z. 50621), 348 (172 + 176) mm.; largest ♀ (M.C.Z. 50614), 341 (185 + 156) mm. and another ♀ (M.C.Z. 50605), also 341 (175 + 166) mm. Fifteen of the seventeen ♂♂ and four of the six ♀♀ are over 300 mm., the smallest (M.C.Z. 50618), 98 (48 + 42) mm.

For measurements of the Mozambique cotypes of *petersii* mentioned by Boulenger (1887a, p. 451) I am indebted to Mr. C. J. Battersby, who finds that all four (B.M. 1946.9.8.17. coll. W. Peters; B.M. 1946.8.3.67–69. coll. McLeod) are females which, in corresponding order to the above numbers, measure: 268 (135 + 134) mm., 295 (149 + 147) mm., 322 (170 + 152) mm., and 320 (165 + 154) mm. He points out that the apparent discrepancy in total lengths is due to their having been measured independently to those of their respective head-and-body or tail.

Breeding. Testes of all the ♂♂ very large, ovules in the ♀♀ small.

Enemies. One very large ♂ was killed by the poison of a Boomslang (*Dispholidus typus*) at Tete.

Aestivation and *Hibernation.* It is curious to note that males only were taken at Kasumbadedza during January, a very hot month with daily temperatures of 100° when the expected monsoon rains failed to materialize. One chameleon was found with head protruding from a hole in the sandy bank of a dry river bed. Next day I dug another from near the base of a tree growing in the middle of another dry watercourse. This chameleon was completely buried in sand, above which was piled flood debris that had lodged against the base of the tree (12 & 13.i.49).

From May to October Mitchell (1946, p. 25) found chameleons scarce on the lower reaches of the Shire, and suggests they were hibernating, as in August he found one beneath a stone in Southern Rhodesia.

Habits. On February 25, in the course of a sixty-mile run from Mtimbuka to Kausi and back, four chameleons were seen crossing the road. Two of them between 3 and 4 p.m. on a sunny afternoon, so that Mitchell's (1946, p. 26) limiting of such peregrinations to the forenoon is not justified.

Chamaeleo melleri (Gray)

Plate 2, figures 1–2

Ensirostris melleri Gray, 1864, Proc. Zool. Soc. London, p. 478, p. xxxii, fig. 1: "Mountains in the interior of East Africa." now restricted to Zomba, Nyasaland.

Chamaeleon melleri Boulenger, 1887a, p. 472; Günther, 1894a, (1893) p. 618; Johnston, 1897 and 1898, p. 361; Mitchell, 1946, pp. 25, 41.

7 ♂♂, 2 ♀♀, 2 juv. (A.M.N.H. 67797–805, 67807–8) Likabula R. 1946.
♂ (M.C.Z. 50642) Zomba Plateau. 10.ix.48.
♀ hgr. (M.C.Z. 50643) Blantyre. 15.iv.49.
♀ (M.C.Z. 50644) Cholo Mtn. 24.iii.49
2 juv. (M.C.Z. 50645–6) Ruo River. 1.iv.49.

Records. The somewhat vague type locality may be restricted to Zomba which is the type locality of *Rhynchogale melleri* (Gray), for Dr. J. C. Meller, a medical missionary, apparently only visited the Lower Shire and Shire Highlands during the two years or so that he spent in Nyasaland. "Occurs only in the Shire Highlands," according to Mitchell. Certainly the five localities listed above are covered by this statement, but as the species is known from Mozambique and the coastal belt of Tanganyika (13 localities) inland to Kilosa, it may be looked for in the lowlands of Nyasaland.

Native names of the Giant One-horned Chameleon. *Kalilombe* (Ngoni); *kanganjoru* (Manganja).

Variation. In the two youngest (A.M.N.H. 67807–8) the rostral horn scarcely projects above the bony base which is little more than a swelling on the snout of chameleons with an overall length of 124–141 mm.

Size. Largest ♂ (A.M.N.H. 67798), 595-(18 + 270 + 307) mm., is apparently the record for this almost two-foot species; largest ♀ (M.C.Z. 50644), 432 (207 + 225) mm., smallest specimen (A.M.N.H. 67808), 124 (61 + 63) mm.

Breeding. In all five females, four being subadult, the ovules are undeveloped. Mr. J. R. Lennon of Zomba, however, tells me that one of his *melleri* laid 70 eggs, though he considers the average nearer 50. He photographed the eggs being laid, and later stages where the young are emerging from the buried eggs, and climbing twigs stuck in the ground nearby. Unfortunately these photographs were not clear enough for reproduction.

Diet. The stomach of the male from Kasonga Village on Zomba Plateau held the wings of two large dragonflies (? *Aeschna*) and the remains of many grasshoppers; the stomach and intestines of the Cholo female were crammed with large black ants, some of them winged; the young Ruo chameleons held much-chewed fragments of Diptera, a few vegetable fibers and bits of bark, the largest about 10 mm. in length.

Mr. C. J. Ionides writes me (31.viii.48) that he saw a captive *melleri* seize and swallow two very young chameleons; later other persons saw it take a dozen more. These fourteen young were born of a mother

which shared the vivarium with *melleri;* the witnesses thought she was a *dilepis*, but as that species is oviparous it is more probable that they were the offspring of the local *jacksonii* whose female is often hornless and viviparous.

Mr. J. R. Lennon, to whom I am indebted for the photograph reproduced on plate 2, figure 1, informs me (19.xi.46) he has another photograph of a small weaver bird (*Lagnosticta senegala rendalli*) being swallowed head first by one of these giant chameleons.

Parasites. Nematode worms in the Ruo chameleons.

Chamaeleo goetzei nyikae subsp. nov.

Type. M.C.Z. No. 50554, a gravid ♀ from the Nyika Plateau, directly above Nchenachena at about 7500 feet, Nyasaland. Collected by Arthur Loveridge, November 16, 1948.

Paratypes. ♂ ♀ (M.C.Z. 50555–6) Nyika Plateau. November 1–17, 1948. Loveridge coll. ♀ ♀ (A.M.N.H. 67847–8) Nyika Plateau between the camp and the juniper forest. Collected by Dr. L. J. Brass, August 11, 1946.

Diagnosis. No well-defined, slit-like, gular pouches.....*g. nyikae*
A well-defined, slit-like, gular pouch on either side of the throat immediately beneath the lower jaw.....*g. goetzei*

Remarks. On being shown the first of these chameleons in camp, I immediately noticed the absence of the gular pouches that are so prominently displayed by freshly-captured *goetzei* in the mountains of southern Tanganyika Territory, where I captured over eighty of them in 1930. When the other two Nyika specimens were taken I examined both of them for this character, and subsequently in the laboratory all five Nyika chameleons were found to lack these deep skin folds present in preserved material of the typical form. In other respects they resemble the typical form so closely that a detailed description appears unnecessary.

Absence of movable dermal lobes distinguishes them immediately from all other members of the genus known to occur in Nyasaland.

Size. Total length of ♀ holotype (M.C.Z. 50554), 157 (80 + 77) mm. Only ♂ (M.C.Z. 50555), 121 (60 + 61) mm.; largest ♀ (A.M. N.H. 67848), 181 (87 + 94) mm.

Habitat. This species, never before recorded from Nyasaland, must be rare on the inhospitable Nyika where only in the marshy bottoms can it be expected to escape the devastating grassfires that periodically

sweep across these uplands. Though constantly on the lookout for chamelcons during our three weeks stay on the plateau, we found but three. First the ♂, collected by my wife on a low plant in a soggy bottom to the left of the path shortly before reaching our camp at 7,500 feet. As further search proved fruitless I got her to take me and two Africans to the place where, after an hour's hunt the type was found deep in the heart of a fern where it was sloughing its cuticle. The following day Mrs. Loveridge found an immature female crossing the main path that traverses the Nyika; this was taken a mile or two beyond our camp.

Brookesia versus *Rhampholeon*

It was hoped that the results of the anatomical studies on these genera being undertaken by staff and students of the University of Stellenbosch, would have been completed before this paper went to press. Unfortunately the investigations are still in progress (cf. Frank, G. H., 1951, Ann. Univ. Stellenbosch, **27**, A, pp. 33–67).

In my (1951a, Bull. Mus. Comp. Zool., **106**, p. 180) earlier comments on the situation, I implied that Parker (1942, p. 80) had studied only a single representative skeleton of each group; actually he investigated three *Brookesia* and a number of both Malagasy and mainland *Rhampholeon*, as will be seen by reference to p. 82 of his paper. However, in view of the apparent impossibility of separating the two groups on external characters, my own inclination is to regard them as subgenera of *Brookesia*.

Brookesia nchisiensis sp. nov.

Plate 3, figure 1

Brookesia platyceps Loveridge (not of Günther), 1933, Bull. Mus. Comp. Zool., **74**, p. 343 (material from Ukinga, Poroto and Rungwe Mountains, Tanganyika Territory.)

Native name. *Nifwi* (Misuku); apparently no name in Chewa or Ngoni.

Type. M.C.Z. No. 50681, a gravid female from Nchisi Forest, 5000 feet, Nchisi Mountain, Nyasaland. Collected by Arthur Loveridge, December 1, 1948.

Paratypes. 2 ♀♀ (M.C.Z. 50682–83) Nchisi Mtn. 1–2.xii.48.
Juv. & 3 ♀♀ (M.C.Z. 50677–80) Misuku Mtns. 27.ix–16.x.48.

together with all the Tanganyika material mentioned in the above citation.

Diagnosis. Twenty years ago when I submitted one of these Tanganyika specimens to Dr. H. W. Parker for comparison with *platyceps* and *brachyura*, then unknown outside the scant material in the British Museum, it was thought inadvisable to describe them. Now, having seen all the British Museum and other material for myself, it is realized that *nchisiensis* differs from all other Nyasaland species by lacking both axillary and inguinal pits. Several additional differences are set forth in the key on page 307 of the present paper. Sections 6 to 8 of this key, embodying two new forms, replace section 6 *only* of the Key to African *Brookesia* published in 1951 (Bull. Mus. Comp. Zool., **106**, pp. 181–182).

Description. Snout terminating in a flexible rostral process; supraciliary ridge composed of enlarged pointed granules of which one is occasionally horn-like; interorbital region with a somewhat angularly arranged transverse series of enlarged granules; vertebral line weakly crenulated at regularly spaced intervals with the humps bearing granules that are not, or but slightly, larger than those in the intervening hollows; flanks covered with minute granules and very small scattered tubercles; *no axillary or inguinal pits.*

Size. Total length of type ♀ (M.C.Z. 50681), 83 (67 + 16) mm.; of largest paratype ♂ (M.C.Z. 31380) from Nkuka Forest, Rungwe Mtn., 56 (43 + 13) mm. Nyasaland specimens average larger than those from southern Tanganyika where it is wetter and the extensive forests cooler.

Breeding. The following notes were made in Nyasaland.

On September	27,	a ♀	held	12	ova	measuring about 8 x 5 mm.
"	27,	"	"	12	"	" " 8.5 x 5 mm.
October	16,	"	"	15	"	" " 9 x 5.5 mm.
December	1,	"	"	14 (+ 1 already laid)	"	11 x 7 mm.
"	1,	"	"	8 (+ 6 already laid)	"	12.5 x 7 mm.

On December 1, having overturned a tree trunk lying in a leaf-strewn clearing in the very heart of Nchisi Forest, I saw a solitary egg measuring 11.5 x 7 mm. I remarked that the lizard which had laid it must be found, for already we had turned fully forty logs in the forest and dug beneath them without discovering a single reptile or amphibian. A moment later, among the dead leaves that had drifted against the log, I observed an olive-colored *Brookesia*. I picked it up and my gunbearer started raking aside the leaves where it had been,

uncovering 6 more eggs of the same size as the one already found, each two-thirds buried in the rich black loam and well-separated from its nearest neighbor. Postulating that such fresh-looking eggs must have been laid by the reptile I had caught (which subsequent dissection revealed as holding 8 more), I said the solitary egg must have been laid by yet another pygmy chameleon which, after intensive search, we discovered and found she held 14 eggs still to be laid. Opening the solitary egg I noted that it contained an embryo, as was the case with the unlaid ones. On December 2, a third gravid ♀, with embryos in her eggs, was found among leaves lying against a log in another part of the forest.

Enemies. The stomachs of each of two male Vine-Snakes (*Thelotornis k. capensis*) brought in on October 16, yielded two gravid *Brookesia*, one much digested, the other (M.C.Z. 50680) worth preserving.

Parasite? On the right flank of M.C.Z. 50681 was a large skin-covered protruberance that I supposed harbored a dipterous larva, but my colleague, Dr. J. C. Bequaert, after removing the top of the swelling, failed to find any trace of a parasite.

Habitat. A tiny chameleon, measuring only 26.5 mm. over all, was found lying on the ground at the base of a wild banana from which we had been stripping the outer leaves, one of a group of plants surviving beside a stream at the forest edge. Similarly a gravid female was taken beneath a wild banana in a ravine in Matipa Forest. In conjunction with the breeding records of this species, it seems certain that it is a forest, or forest-edge form.

Brookesia brachyura brachyura (Günther)

Rhampholeon brachyurus Günther, 1893 (1892), Proc. Zool. Soc. London, pp. 555, 557, pl. xxxiv, figs. 2–2a: Shire Highlands, Nyasaland. Günther, 1894a (1893), p. 619; Boulenger 1894e, p. 725; Bocage, 1896a, p. 103; Johnston, 1897, p. 361; 1898, p. 361a; Monk, 1903, pp. 326, 327.
Rhampholeon brevicaudata Mitchell (not of Matschie), 1946, p. 26.

Type	? ♀ (B.M. 92.12.31.22) Shire Highlands.	37 + 7 mm.
"	? ♀ (B.M. 92.12.31.23) Shire Highlands.	26 + 5 mm.
	♂ (B.M. 93.10.26.36) Zomba (H.H.J.)	28 + 8 mm.
	♀ (B.M. 47.1.3.83) Mudi R., Blantyre.	41 + 8 mm.
	♂ (M.C.Z. 52131) Nansadi R., Cholo	46 + 7 mm.
	♀ (M.C.Z. 52132) Nansadi R., Cholo	46 + 8 mm.

Records. Shire Highlands (G); Zomba (Mitchell, specimen now believed to be in the National Museum at Bloemfontein).

Variation of the six specimens listed above; studied at the British Museum. Trinomials are used because of *B. b. ionidesi* Loveridge, 1951, of southeast Tanganyika Territory which differs in lacking the numerous strongly developed granular tubercles displayed by the typical form. Snout without a terminal rostral process; supraciliary ridge, at least anteriorly, composed of prominent, often spine-like, granular tubercles; interorbital region *without* a transverse series of enlarged granules; vertebral line *not*, or but indistinctly, crenulate, many of its component granules enlarged, conical, but not grouped; flanks covered with minute granules and scattered tubercles; a small pit beneath forearm but *none* in groin.

Size. As given above.

Breeding. Both the Mudi and Nansadi River ♀ ♀ are gravid, the latter, received at the Zoological Gardens, London, on March 23, but date of death unknown, holds 6 eggs measuring about 9.5 x 5 mm. and apparently almost ready for laying.

Habitat. Mr. Mitchell informs me that he collected the three chameleons in gallery forest along the Mudi and Nansadi rivers. The former at a point just below Blantyre Golf Course, the Nansadi reptiles at Mikolongwe — which is about 12 to 14 miles from Limbe.

Brookesia platyceps platyceps (Günther)

Rhampholeon platyceps Günther, 1893 (1892), Proc. Zool. Soc. London, pp. 555, 556, pl. xxxiv, figs. 1–1a: Shire Highlands, Nyasaland. Günther, 1894a (1893), p. 619; Boulenger, 1894e, p. 725; Bocage, 1896a, p. 103; Johnston, 1897, p. 361; 1898, p. 361a; Monk, 1903, pp. 326, 327; Werner, 1911, p. 47; Mitchell, 1946, p. 27.

Type ♀	(B.M. 92.12.31.21)	Shire Highlands.	50 + ?, tail lost
♂	(B.M. 93.10.26.35)	Chiromo, Shire R.	54 + 18 mm.
♂	(B.M. 33.4.3.4)	Lichenya Plateau.	50 + 14 mm.
♀	(M.C.Z. 50749)	Ruo Gorge, Mlanje.	62 + 17 mm.

Records. Chiromo (as Tshiromo; G); Shire Highlands (G).

Native name of Flat-headed Short-tailed Chameleon. *Namandondo* (Nyanja).

Variation of the four known specimens; examined at the British Museum. Snout terminating in a small rostral process (scarcely distinguishable in type but flexible and longer in the other three

specimens where its length may be as much as 1 mm.); supraciliary ridge with a horn-like tubercle or process (not shown in figure of type); interorbital region with a non-angular transverse series of enlarged granules; vertebral line crenulated at regularly spaced intervals with the humps bearing granules scarcely larger than those in the intervening hollows; flanks covered with granules and scattered tubercles which are smaller than those of the race described below; a small pit beneath forearm and a less distinct one, a mere slit, in the groin anteriorly.

Size. As given above.

Breeding. On February 17 the Ruo Gorge ♀ held a single egg measuring 13 x 6 mm., she having doubtless just deposited the rest of the clutch.

Habitat. The Ruo Gorge ♀ was taken in thick forest close to the Power House at the lower end of the Gorge. For this choice reptile the Museum is indebted to J. F. Ramsden, Esq., manager of the Lujeri Estate. It will be noted that one ♂ is said to have come from the Lichenya Plateau which, if correct, appears to militate against the assumption of an upland and lowland race: the possibility that it was brought in by a native and taken on the way up or down from the plateau is worth investigating.

Brookesia platyceps carri subsp. nov.

Plate 3, figure 2; text-figure A

Type. A.M.N.H., No. 67823, a gravid female from Lichenya Plateau, 6000 feet, Mlanje Mountain, Nyasaland. Collected by Dr. L. J. Brass between June 24 and July 18, 1946.

Paratype. A.M.N.H., Nos. 72639, 72747, 72749, being three adult males from Ruo Gorge, between 3000 and 3500 feet, Mlanje Mountain, Nyasaland. Collected by Dr. A. F. Carr Jr., September 6, 1952. As might be expected, these paratypes are in the nature of intermediates but agreeing more nearly with the Plateau form.

Diagnosis. Differs from typical *platyceps* in the absence, or but indication of (at least in the ♂♂ and ♀ seen) a raised tubercle or hornlike process on the supraciliary ridge; also in the presence of much-enlarged, spine-like granules forming clumps along the crenulated vertebral line.

Description. Snout without trace of a flexible, terminal, rostral process (also absent in one of Carr's males, but present in the other

two males); supraciliary ridge without any horn-like process; interorbital region with a curved, non-angular, transverse series of enlarged granules; vertebral line crenulated at regularly spaced intervals with groups of enlarged (the centre one much-enlarged), more or less spine-like granules on the humps; flanks covered with granules and scattered tubercles larger than those of *p. platyceps;* a small pit beneath forearm and another in groin anteriorly.

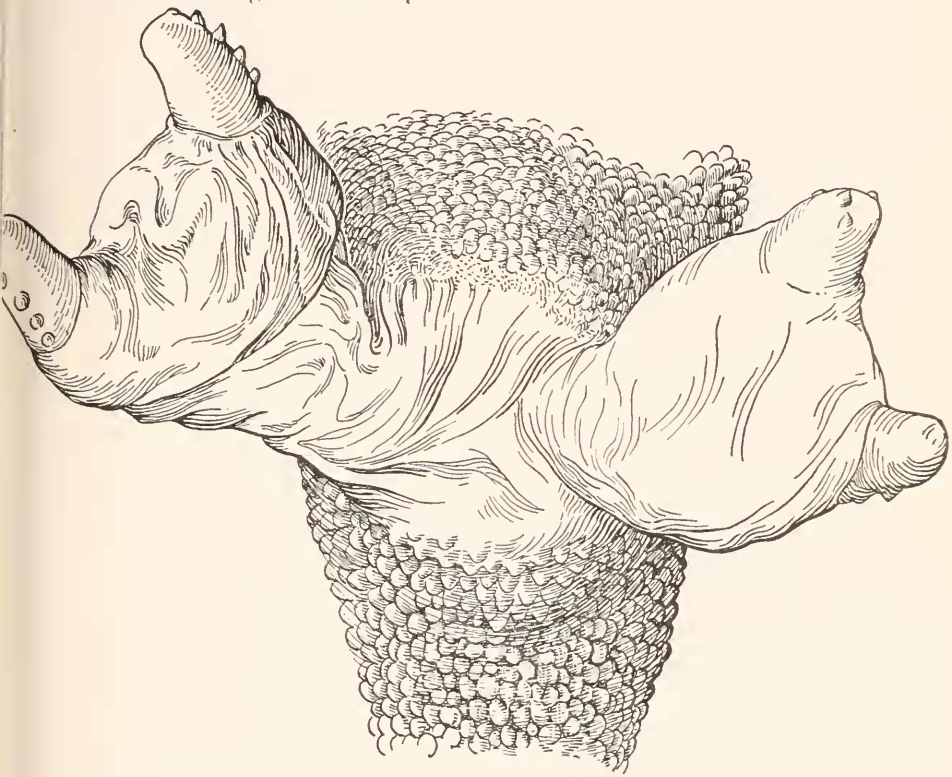

Fig. A. Hemipenes of ♂ paratype (A.M.N.H. 72749).

Hemipenis. Two of the ♂ paratypes present everted hemipenes of a most peculiar appearance. Each consists of a thin-skinned, sac-like swelling from each of which arises a pair of well-separated, slightly compressed, recurved, claw- or horn-like organs along whose outer edge, flanking the sulcus, are a series of four papillae resembling soft spines.

Size. Total length of type ♀ (A.M.N.H. 67823), 75 (59 + 16) mm.; paratype ♂ (A.M.N.H. 72639), 86 (61 + 25) mm. The tail of the ♀ is included 4.68 times in the total length, those of the ♂♂ from 3.35 to 3.44 times.

Breeding. In late June or early July the ♀ type held 12 spherical ova of which the largest was only 4.5 mm. in diameter.

Habitat. Dr. Carr informs me that the three pygmy chameleons collected by him, were taken "in the transition zone between rain forest, with aroids and lianas, and a mist forest with *Podocarpus* and *Usnea*," as he ascended the Ruo Gorge trail from the Lujeri Estate power house to the Ruo Falls. He was informed that during the previous year the power house rain gauge had registered a fall of 177 inches. The three male chameleons were all found walking upon the leaf-strewn path. I understand that the type was accidentally found upon some botanical specimens that were being carried to camp by Dr. L. J. Brass.

SCINCIDAE

Mabuya quinquetaeniata obsti Werner

Mabouia quinquetaeniata Günther (not of Lichtenstein), 1893 (1892), p. 555; Johnston, 1897, p. 361.

Mabuia quinquetaeniata Boulenger, 1897e, p. 800; Johnston, 1898, p. 361.

Mabuia obsti Werner, 1913, Mitt. Nat. Mus. Hamburg, **30**, p. 43: Kwa Mtoro, Central Province, Tanganyika Territory.

Mabuia quinquetaeniata margaritifer Mitchell (not of Peters), 1946, p. 27.

1 (M.C.Z. 50751) Nchisi Mtn. 1.xii.48.
5 (M.C.Z. 50752–6) Chitala R. 14.xii.48.
1 (M.C.Z. 50757) Chowe. 12.ii.49.
3 (M.C.Z. 50758–60) Mtimbuka. 16.ii.49.
1 (M.C.Z. 50761) Chiradzulu Mtn. 27.viii.48.
12 (M.C.Z. 50762–73) Likabula R. 2–5.viii.48.
1 (M.C.Z. 50774) Ruo River. 1.iv.49.

Records. Nkata Bay to Ruarwe (B); Nyika district (B); Shire Highlands (G).

Native names of the Tanganyika Five-striped Skink. *Bulunzi wa nyala* (Chewa; Ngoni); *kiswakongono* (Nyanja); *kukumala* (Yao). Mitchell (1946, p. 43) gives *buluzi* as the Chewa and Nganja name for lizards in general.

Variation. One of the points that I hoped to elucidate during my

visit to Nyasaland was whether the form of *quinquetaeniata* occurring there might be *obsti* of Tanganyika (as I suspected) rather than the South African form (as had been reported). The number of midbody scale-rows clearly shows Nyasaland skinks belong to the equatorial form which has a higher count than have the races to the north and south. Thus:

Midbody scale-rows 40–44; range: Eastern Africa south of the Zambezi ..... *q. margaritifer*

Midbody scale-rows 44–48, rarely 42; range: Eastern Africa north of Zambezi ..... *q. obsti*

To ascertain if there were other supporting characters I made a detailed study of the variation displayed by the Nyasaland material for purposes of comparison with that shown by topotypic *margaritifer* (*vide infra*), but there seems to be nothing significant, apart from the southern form averaging slightly longer limbs.

Supranasals in contact behind the rostral; centre of nostril posterior to the vertical of the suture between rostral and first labial; postnasal not (23 ex.) or but rarely (1 ex.; M.C.Z. 50761) in contact with the second upper labial; anterior loreal in contact with the first and second (14 ex.), first, second and third (7 ex.), second only (2 ex.), or second and third (1 ex.) labials; supraoculars 4, first smallest, second largest; supraciliaries 5 (43 sides) or 6 (4 sides), usually first smallest, second largest; subocular not narrowed inferiorly, reaching the lip between the fourth (17 sides) or fifth (7 sides) labials; lower eyelid with a transparent disk that is smaller than the ear-opening, which has 4 (8 sides), 5 (14 sides), or 6 (1 or 2 sides) acuminate lobules projecting from its anterior border; frontonasal only in contact with the frontal in two specimens (M.C.Z. 50757; 50772); frontal in contact with the first, second and third (23 ex.) or second and third (1 ex.; M.C.Z. 50774) supraoculars only; frontoparietals smaller than, or subequal to, the interparietal, behind which the parietals are (22 ex.) or are not (1 ex.; M.C.Z. 50771) in contact; nuchals obtusely multicarinate posteriorly, rarely almost smooth.

Midbody scale-rows 42 (1 ex.; M.C.Z. 50751), 44 (3 ex.), 46 (10 ex.), or 48 (10 ex.), average for the 24 specimens 46.5 scale-rows; dorsals strongly tricarinate; preanals not (or but slightly in one or two ex.) enlarged; scales on soles not spinose, subdigital lamellae unicarinate; toes of the adpressed hind limb reach the wrist (5 ex.), elbow (15 ex.), or axilla (4 ex.) of the backward-pressed forelimb.

Color in life. The following notes of a non-breeding pair of this sexually dichromatic, yet strikingly beautiful, skink, were made at the Likabula River camp on August 2, 1948.

♂. Above, dark olive, head flecked with black and cream, eyelids edged with cream, lips greenish white, sharp pointed auricular lobules pale orange, the blunt lower one dusky; from occiput to tail a double series of cream-centred black spots, another widely separated, double series on either dorsolateral region; flanks paler than dorsum and turning to yellowish green below but handsomely spotted with very pale bluish, black-edged ocelli; limbs paler olive above, the anterior pair only displaying black-edged, pale blue spots; tail yellowish-orange with an elongated, wedge-shaped, dusky streak on the dorsal surface and a deeper orange band along either side. Below, throat creamy white changing to grayish flecked with white just below ear-opening; breast, belly, and underside of limbs white tinged with greenish towards the flanks; tail white suffused with orange.

♀. Above, bronze, paler on snout, lips greenish white, upper auricular lobules yellowish but ear-opening tinged with orange inferiorly; from occiput to base of tail is a yellowish, black-edged line with a similar one, commencing at the supraocular region, on either side; flanks paler brown sparsely flecked with black-edged, white ocelli; limbs gray with indistinct dusky markings except on the posterior side of the hind limbs where a white line connects with a similar one on the side of the tail; tail rich ultramarine blue, a wedge-shaped black mark on base of tail dorsally is continued as a dusky line or series of black spots to the tip, a similar black band on either side of tail. Below, throat creamy white; breast, belly, and underside of limbs faintly greenish white; basal quarter of tail white with a dusky line on either side, the remaining three-quarters pale ultramarine blue.

Size. Largest ♂ (M.C.Z. 50762), 282 (117 + 165) mm.; largest ♀ (M.C.Z. 50764), 266 (114 + 152) mm. In size, therefore, there is no appreciable sexual difference other than the more robust habit of the males.

Breeding. Between August 2–5 one ♀ examined, held round ova 9 mm. in diameter.

Diet. In stomach of one a large wasp. Mr. B. L. Mitchell tells me that by baiting petrol cans with rotten fruit (which presumably attracted insects) he captured (May to November, 1944) examples of these skinks from two small colonies on rocky outcrops of the southern cliffs on Zomba Plateau, where I failed to see any during the eleven

days (September 1–13) I spent there in rather cool weather.

Habitat. On rocks above Nchisi boma; on rocks along river bed at Chitala; on rocks above house at Chowe; on rocks of the eastern spur of Chiradzulu; on rocks beside river at Likabula; on cement base of power house in the Ruo Valley.

Mabuya quinquetaeniata margaritifer (Peters)

Euprepes margaritifer Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 618: Tete, Mozambique.
Euprepes savignyi Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 618: Tete, Mozambique.
Euprepis gularis Gray, 1864, Proc. Zool. Soc. London, p. 61: Southeast Africa.
Euprepis kirkii Gray, 1864, Proc. Zool. Soc. London, p. 62: Tete, Mozambique.

27 (M.C.Z. 50775–801) near Tete. 6–28.i.49.

Native names of Southern Five-striped Skink. *Mbuuyu fife* (♂), *mbuuyu burumu* (♀) (Nyungwe).

Variation. Supranasals in contact behind the rostral; centre of nostril posterior to the vertical of the suture between rostral and first labial; postnasal not (26 ex.) or barely (1 ex.; M.C.Z. 50785) in contact with the second upper labial; anterior loreal in contact with the first and second (8 ex.), first, second and third (18 ex.), or second and third (1 ex.) labials; supraoculars 4, first smallest, second largest; supraciliaries 5 (49 sides) or 6 (5 sides), usually first smallest, second largest; subocular not narrowed inferiorly, reaching the lip between the fourth and fifth (17 ex.) or fifth and sixth (10 ex.) labials; lower eyelid with a transparent disk that is smaller than the ear-opening, which has 4 (1 side; M.C.Z. 50796), 5 (14 sides), or 6 (12 sides) acuminate lobules projecting from its anterior border; frontonasal not in contact with the frontal; frontal in contact with the first and second (3 sides) or first, second and third (51 sides) supraoculars; frontoparietals smaller or subequal to the interparietal, behind which the parietals are in contact (27 ex.); nuchals obtusely multicarinate posteriorly, rarely almost smooth.

Midbody scale-rows 40 (7 ex.), 42 (10 ex.), or 44 (10 ex.), average for the 27 specimens 42.2 scale-rows; dorsals strongly tricarinate; preanals not enlarged; scales on soles not spinose; subdigital lamellae unicarinate; toes of the adpressed hind limb reach the wrist (2 ex.), elbow (12 ex.), axilla (10 ex.), or shoulder (3 ex.) of the backward-pressed forelimb.

Size. Largest ♂ (M.C.Z. 50775), 283 (100 + 183) mm.; largest ♀ (M.C.Z. 50786), 257 (104 + 153) mm. Surpassed in head-and-body length by a ♂ of 111 mm., a ♀ of 105 mm. so in size there is little difference between these topotypical *margaritifer* and Nyasaland *obsti*.

Habitat. The eroded rocky hills around Tete provide ideal conditions for this rupicolous skink which is consequently abundant. Most of my specimens came from rocks along the south bank of the Zambezi three or four miles west of Tete township. It is not often that one can collect three, possibly four, topotypes at one and the same time, as was the case here, in part due to the striking sexual dichromatism.

Mabuya maculilabris comorensis (Peters)

Euprepes comorensis Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 619: Anjuan, *i.e.* Johanna Island, Comoro Islands.

♂ (M.C.Z. 50750) Ruo River. 1.iv.49.

Records. New to Nyasaland, but Mr. B. L. Mitchell informs me (27.viii.48) that he has taken *maculilabris* at Chikwawa and Chiromo on the Shire River. Possibly his specimens are referable to this race; see remarks under *M. m. boulengeri* below.

Variation. Supraciliaries 6–7; midbody scale-rows 34; dorsals septem- or novemcarinate.

Color. Below, throat white streaked with brown; chest and belly to anus bright yellow. Testes large.

Size. Total length of ♂, 184 (77 + 107) mm.

Diet. Grasshoppers in stomach.

Habitat. One of a pair living beneath crossplanks on the 'suspension' bridge (since removed) straddling the well-forested Ruo Gorge near Lujeri Estate.

Mabuya maculilabris boulengeri Sternfeld

Mabuia boulengeri Sternfeld, 1911, Sitzb. Ges. Naturf. Freunde Berlin, p. 248: Makonde Plateau, Lindi Province, Tanganyika Territory.

♂ (M.C.Z. 50700) Mtimbuka. 22.ii.49.

Records. New to Nyasaland. This form differs from *m. comorensis* in possessing a consistently lower number of supraciliaries and midbody scale-rows, besides having a more slender body, relatively longer tail, and duller coloring.

Variation. Supraciliaries 4–4; midbody scale-rows 30; dorsals septemcarinate.

Size. Total length of ♂, 199 (74 + 125) mm.

Diet. A single large spider in stomach.

Habitat. Observing a slight twitching of a few leaves, that formed part of a mass of creepers smothering a bush or tree, I covered the spot, which was twelve feet from the ground, with my .22 collecting gun, simultaneously instructing my gunbearer to gently shake one of the lianas. As he ceased to shake, a lizard's head appeared among the foliage; I fired and down fell this fine specimen with a dust shot through the neck. I have the impression that this race is rather more addicted to arboreal habits than is *comorensis*, with both of which I have had experience in Tanganyika.

Mabuya lacertiformis (Peters)

Euprepes lacertiformis Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 618: Boror, Mozambique.

1 (M.C.Z. 50802) near Mtimbuka. 16.ii.49.
1 (M.C.Z. 50803) near Mpatamanga Gorge. 31.i.49.
29 (M.C.Z. 50804–13) Kasumbadedza, M. 6–22.i.49.

Records. These constitute the first records of the occurrence of this distinctive skink in Nyasaland. Indeed, since the original description appeared a century ago, the only fresh material collected were nine specimens taken at Beira and Caia by Cott (1934a, p. 166).

Native name of the Lizard-like Skink. *Nshela* (Nyungwe).

Variation. Supranasals in contact behind the rostral; centre of nostril *anterior* to (29) or above (2) the vertical of the suture between rostral and first labial; postnasal not in contact (24) or in contact (7) with the second labial; loreal in contact with the first and second (24), second only (4), or the second and third (3) labials; supraoculars 4–4, first smallest, second largest; supraciliaries 4 (7 sides), 5 (48 sides), or 6 (4 sides); subocular narrowed inferiorly, reaching the lip between the fourth and fifth (2), fifth and sixth (26), or sixth and seventh (1) labials; lower eyelid with a transparent disk that is larger than the ear-opening, which has 3 (26) or 4 (5) more or less acuminate lobules projecting from its anterior border; frontonasal in contact with the frontal (29); frontal in contact with the first, second and third (15 sides), or second and third (47 sides) supraoculars; frontoparietals subequal to, or smaller or larger than, the interparietal, behind which

the parietals meet (29), though sometimes barely; nuchals, when not broken up (1), entirely multicarinate (28).

Midbody scale-rows 36 (13), 37 (2), 38 (13), or 40 (3); dorsals very strongly tricarinate or quinquecarinate, when five the laterals are less developed than the three main keels; preanals not, or but slightly, rarely distinctly, enlarged; scales on soles *strongly spinose;* subdigital lamellae unicarinate and serrate; toes of the adpressed hind limb reach the wrist (2), elbow (9), axilla (11), or shoulder (9) of the backward-pressed forelimb.

Size. Largest ♂ (M.C.Z. 50807), 131 (48 + 83) mm., largest ♀ (M.C.Z. 50805), 120 (52 + 68) mm.; the smallest (M.C.Z. 50803), 67 (26 + 41) mm.

Breeding. On January 6, a ♀ held eggs measuring 8.5 x 6 mm. Many others of the series are obviously gravid but have not been examined as it would involve damage to the unusually delicate skin.

Enemies. A freshly-swallowed tail was recovered from the stomach of a Stripe-bellied Sand-Snake (*Psammophis s. subtaeniatus*); the lizard had escaped.

Habitat. Though during the dry season (100° daily at Kasumbadedza) these rupicolous lizards were abroad in the early morning, they appeared to be more active towards sunset when hunting for their insect prey among the drifts of dried leaves that accumulate along the base of the shelving rocks or rounded boulders. This habitat they share with *Mabuya q. margaritifer* but are likely to be overlooked owing to their cryptic coloring and quiet movements. The Mtimbuka skink actually came from the summit of the rocky hill behind Dr. Fitzmaurice's house on the lakeshore about twenty-five miles north of Fort Johnston. The Mpatamanga specimen inhabited the same group of rocks as the new species of *Platysaurus*. All had to be shot as there was no other way of obtaining them.

Mabuya striata ellenbergeri Chabanaud

Mabuia ellenbergeri Chabanaud, 1917e, Bull. Mus. Hist. nat. Paris, **23**, p. 219, figs. 1–2: Lealui, Upper Zambezi, Northern Rhodesia.

49 (M.C.Z. 50701–42) near Tete. 5–16.i.49.

Range and Status. In literature previously known only from the extremely young holotype with which some of my specimens have been compared through the courtesy of Mons. Jean Guibé of the Paris

Museum. The type came from a point about 650 miles due east of Tete, or over 800 miles up the Zambezi. This gap is bridged by an example (M.C.Z. 21652) from the Victoria Falls and a second (M.C.Z. 29210) from Livingstone, Northern Rhodesia, four miles north of the Falls. It would appear to have reached the vicinity of Tete since Wilhelm Peters made his extensive collections there in 1844–5, for he failed to secure any specimens though it is now so abundant that I obtained 23 with 26 shots on the morning of January 8.

Though *Mabuya striata* is the commonest lizard in East Africa, these Tete skinks were so strikingly different in coloration that the idea of them being referable to *striata* never entered my head until I made a study of their lepidosis in the laboratory. Distinctive though the entire Tete series is in appearance, it is clearly only a race of *striata* for intergrades in color pattern between it and typical *striata* (M.C.Z. 51342–6) occur at the Victoria Falls, and between it and those *striata* in which the subocular fails to reach the lip at both the Falls (M.C.Z. 51347–9) and at Livingstone (M.C.Z. 29211–2). It apparently corresponds to the color form C described by FitzSimons (1935b, p. 372) as characteristic of "practically all the specimens from west and north of Kaotwe."

M. s. ellenbergeri appears to be closely related to *M. binotata* from which it can be distinguished by:

Scales on soles sharply spinose; subdigital lamellae strongly unicarinate . . . . . *s. ellenbergeri*

Scales on soles smoothly tubercular (inclined to be bluntly spinose in young according to FitzSimons); subdigital lamellae smooth or feebly unicarinate . . . . . *binotata*

Native name. *Mbunyu* (Nyungwe, but also applied to *M. q. margaritifer*).

Variation. Based on the entire series; unless damaged, both sides of each individual were examined except in the case of labial characters when sometimes the right side only was deemed sufficient.

Supranasals in contact behind the rostral; centre of nostril posterior to the vertical of the suture between rostral and first labial; postnasal not in contact with the second upper labial; anterior loreal in contact with the first, second, and third upper labials (31 ex.), or second and third only (18 ex.); supraoculars 4 (3, through fusion of first and second, on left side of M.C.Z. 50719; possibly 5 on both sides of M.C.Z. 50722), first smallest, second largest; supraciliaries 4 (6 sides),

5 (82 sides), or 6 (9 sides), usually first smallest, second largest; subocular much narrowed inferiorly (except in M.C.Z. 50717 where it rests upon the fifth and sixth labials so fails to reach the lip) reaching the lip between the fourth and fifth (M.C.Z. 50740 only), the fifth and sixth (22 ex.), or sixth and seventh (25 ex.) labials; lower eyelid with a transparent disk that is subequal to, or larger than, the ear-opening, which is vertically oval without (M.C.Z. 50728 only), or with 1 (3 ex.), 2 (5 ex.), 3 (31 ex.), 4 (8 ex.), or even 5 (left side only of M.C.Z. 50717) more or less acuminate lobules projecting from its anterior border; frontonasal in contact with (37 ex.) or separated from (12 ex.) the frontal; frontal in contact with the first, second, and third (10 sides), or only second and third (88 sides) supraoculars; frontoparietals smaller or subequal to the interparietal, behind which the parietals are (30 ex.), or are not (16 ex.) in contact; nuchals (rarely not developed) obtusely multicarinate posteriorly.

Midbody scale-rows 34 (5 ex. as in the type also), 35 (1 ex.), 36 (21 ex.), 37 (5 ex.), 38 (17 ex.) or, astonishingly enough, 42 (in M.C.Z. 50737 only), this figure having been checked and rechecked, average for the 49 specimens 37.4 scale-rows; dorsals strongly tricarinate with or without an outer pair of keels represented by a mere raised dot (27 ex.), or more or less strongly quinquecarinate (22 ex.), these latter usually being the biggest skinks; preanals not (or but slightly in one male) enlarged; scales on soles strongly spinose; subdigital lamellae sharply unicarinate and spinose; toes of the adpressed hind limb reach the fingers (3 ex.), wrist (22 ex.), elbow (27 ex.), or axilla (3 ex. all under 71 mm. from snout to anus) of the backward pressed forelimb.

Color in life. Above, head from snout to nape orange brown, from the loreal region to above the forearm is a conspicuous, broad, black band that tends to fade out on flank but may continue to the hind limb; back brown with a slightly paler dorsolateral stripe, about two scales in width, extending on to the base of the tail which otherwise is uniformly pale brown. Below, both upper and lower lips and throat, lemon yellow; body and tail white.

Size. Largest ♂ (M.C.Z. 50706), 257 (93 + 164) mm.; largest ♀ (M.C.Z. 50717), 222 (90 + 132) mm.; the type was only 108 (67 + 41) mm.

Breeding. Many, possibly all, the females are gravid in January; one held 6 eggs measuring about 11 x 8 mm., but in others there are embryos.

Diet. The much-chewed remains of beetles, representing three

families, a cockroach and its egg-purse, recovered from one of these lizards, were recognized by my colleague Dr. P. J. Darlington.

Enemies. One lizard was recovered from the stomach of a Stripe-bellied Sand-Snake (*Psammophis s. subtaeniatus*).

Habitat. In the early morning one or two of these skinks might be seen basking on the trunk of almost every mopane tree. These exclusively arboreal lizards proved exceedingly wary, rarely permitting a person to approach nearer than twenty feet from them before slipping into the cavity provided by most mopane trees, with whose distribution possibly their own is linked.

Mabuya striata striata (Peters)

Tropidolepisma striatum Peters, 1844, Ber. Akad. Wiss. Berlin, p. 36: Mozambique.

Mabuia striata Boulenger, 1897e, p. 800; Johnston, 1898, p. 361; Mitchell, 1946, p. 27.

2 (A.M.N.H. 67833–4) Kasungu. 18–23.viii.46.
1 (A.M.N.H. 67824) Lichenya Plateau. vi–vii.46.
6 (M.C.Z. 50864–8) Misuku Mtns. 29–30.ix.48.
3 (M.C.Z. 50869) Nchenachena. 20.xi.48.
3 (M.C.Z. 50870–2) Chitala River. 14.xii.48.
2 (M.C.Z. 50873–4) Mtimbuka. 10.ii.49.
1 (M.C.Z. 50875) Zomba Plateau. 1.ix.48.

Records. Chikwawa (M. ms.); Chiromo (M. ms.); Fort Hill (B); Fort Johnston (M. ms.); Karonga to Kondowe (B); Limbe (M. ms.); Monkey Bay (M. ms.); Nkata Bay to Ruarwe (B); Nyika District (B); Nyika Plateau (B); Port Herald (M. ms.).

No effort was made to collect this common Two-striped Skink which was seen at Blantyre (31.xii.48); Chinunkha (18.x.48); Cholo Mtn. (17.iii.49); Kausi Village (25.ii.49); Lichenya Plateau (6.viii.48); and Nchisi Mtn. (27.xi.48). Though I was constantly on the lookout for this form during the month spent near Tete, none was seen there.

Native names of the Two-striped Skink. *Mbulundwe* (Yao, but generic); *mbulunzi* (Chewa; Ngoni); *shioloe* (Misuku, but generic).

Variation. Frontonasal in contact with the frontal (in 15) or separated by the prefrontals (in 3); lobules on anterior border of the ear 0–5, but normally 3; midbody scale-rows 36–40, the highest number on a duplicate Nchenachena specimen only.

Noting that of the 9 most northerly specimens 7 were of the

primitive form in which the subocular rests upon the labials, and of the 9 southern examples 7 were typical *striata* with the subocular reaching the lip between two labials, I made an intensive study of the more than 200 "*striata*" (from 85 localities) in the Museum's collection in an effort to determine whether the distribution of the two forms was such as to justify the recognition of a race — for which a name is available.

Plotting the records on a map of Africa revealed that the primitive form apparently came down the rift valley, being dominant about Lakes Victoria, Kivu, Tanganyika and the north end of Nyasa. South of that point the situation is confused and our material scanty, but the published data of Dr. V. FitzSimon's huge series seems to lend little support to separation. Typical *striata* is dominant on the coastal plains of Kenya and Tanganyika to Mozambique Island — type locality of *striata*. South of that I have no coastal material except five specimens from Lourenço Marques and Umvoti River Mouth, all of which are the primitive, *not* the typical form!

Irrespective of this sublabial character it was observed that the majority of skinks from localities north of the Central Railway of Tanganyika tended to have the centre of the nostril directly above the vertical of the suture of rostral and first labial, while in those from south of the Central Railway it tended to be behind. The character is a somewhat nebulous one for it is frequently difficult to decide to which category an individual skink should be assigned. The distribution of a species that is so intimately connected with man, must have been affected to a considerable degree by human migration.

Parasites. The deep armpits of one Misuku skink were filled with bright red mites.

Habitat. Another Misuku skink lived in a mouse hole flanking the path near our camp at 6000 feet and remote from any human habitation. On the day of our arrival on Lichenya Plateau, also 6000 feet, I counted five of these skinks basking on the mud wall of one of the foresters' huts which I feel confident they had reached through human agency as they were not seen elsewhere during our stay on the plateau. At Chitala River one was found in a gasoline-can bat-trap set up beneath the eaves of the office. Most frequently they were seen on walls or in the vicinity of villages, less frequently on hollow trees.

MABUYA BOCAGII MLANJENSIS subsp. nov.

Type. M.C.Z. No. 50692, an adult male from Lichenya Plateau, 6000 feet, Mlanje Mountain, Nyasaland. Collected by Arthur Loveridge, August 9, 1948.

Paratypes. M.C.Z. Nos. 50693–9, both males and females with the same data as the type but taken August 9–24, 1948.

Diagnosis. From inadequately-known *bocagii* of Angola, with a Congulu specimen of which I have been able to compare it through the courtesy of Dr. H. W. Parker, the differences are minor and may prove of average importance only. *M. b. mlanjensis* differs from *b. bocagii* in the centre of the nostril *not* being anterior to the vertical of the suture between the rostral and first labial, in its anterior loreal *usually not* being in contact with the first labial, and in the probability that the number of its midbody scale-rows (36–38) average lower than those of *bocagii* (36–40) which are so frequently 40; the limbs of *mlanjensis* apparently tend to be shorter than those of Angolan *bocagii*. In *mlanjensis* the vertebral line, when present, is noticeably narrower than in the Congulu *bocagii*.

From *v. varia*, which is the common skink on Mlanje, *b. mlanjensis* may be distinguished by the absence of a white lateral line, and the presence of more numerous (36–38, instead of 30–34) scales around midbody, besides larger size. In addition there are average differences such as the number of labials anterior to the subocular (5–6 in *mlanjensis*, 4–5 in *varia*). The discovery of this montane form makes it probable that *M. brauni* Tornier, from the Ukinga Mountains at the north end of Lake Nyasa and about 500 miles north of Mlanje, is not a race of *varia* as I once (1933h, pp. 317–318) suggested, but a race of *bocagii* Boulenger, of which *mlanjensis* is the southeastern representative.

Description. Supranasals in contact behind the rostral; centre of nostril slightly posterior to (type and 6 paratypes), or directly above (2) the vertical of the suture between rostral and first labial; postnasal not in contact with the second upper labial; anterior loreal in contact with the first and second (type and 5), first, second and third (1), or only second (1) labial; supraoculars 4, first smallest, second largest; supraciliaries 5 (type and 11 sides), or 6 (3 sides), first usually smallest, second largest; subocular strongly narrowed inferiorly, *reaching the lip* between the fifth and sixth (type and 6), or sixth and seventh (1) labials; lower eyelid with a transparent disk that is subequal to, or

larger than, the ear-opening, which has 1 (2 sides), 2 (type and 5 sides), or 3 (7 sides) more or less acuminate lobules projecting from its anterior border; frontonasal in contact with (7), or separated from (type and M.C.Z. 50696) the frontal; frontal in contact with the first, second and third (type), or second and third (13 sides) supraoculars; frontoparietals smaller than, or subequal to, the interparietal, behind which the parietals meet (in all); nuchals, when not broken up (2), sharply (type) or obtusely multicarinate.

Midbody scale-rows 36 (type and M.C.Z. 50695) or 38 (6); dorsals all strongly tricarinate; preanals not enlarged; scales on soles strongly spinose; subdigital lamellae unicarinate and serrate; toes of the adpressed hind limb barely meet (M.C.Z. 50695), or overlap the fingers (type and 4), or reach the wrist (2) of the backward pressed forelimb.

Color. Essentially similar to that of *M. hildae* described below. Type ♂ following preservation in formalin. Above, bronzy to blackish brown flecked with lighter; three pale buff longitudinal lines of which the vertebral originates on the nuchals as four slender lines that converge at a point about level with the forelimbs, the dorsolateral lines arise in the supraocular region and continue on to the tail where they merge with the vertebral to form a single line; upper and lower labials white (dark in most paratypes), the white being continued very faintly as a line that crosses the ear-opening and reaches the forelimb. Below, centre of throat white edged with gray, the latter predominating on all undersurfaces (in some paratypes the median line of the belly is more or less whitish).

In life, one ♂ (12.viii) had an orange spot on each gular scale for fourteen rows behind the mental; a gravid ♀ (9.viii) had orange spots on her throat; sometimes the tails of the males exhibit a rosy glow.

Size. Total length of type ♂ (M.C.Z. 50692), 136 (60 + 76) mm. but tail regenerated; length of paratype ♀ (M.C.Z. 50695), 170 (72 + 98) mm., her head and body length being equalled by a ♂ paratype with regenerated tail.

Breeding. On August 12, at 1 P.M., I observed a pair in coitu on a large stone, the ♀ encircled in a coil of the male's body; his tail was pinkish. On August 24, at 11 A.M. in bright sunshine, I saw one skink chase another and just as she reached some rocks, seize her by the tail, whereupon pairing took place immediately. On August 10 a gravid ♀ held tiny embryos with pigmented eyes.

Parasites. Mites are occasionally present in the armpit, but a deep pocket is rarely present.

Enemies. One recovered from the stomach of a snake (*Psammophylax t. variabilis*).

Habitat. If disturbed when sunning on the burnt-over grasslands these skinks dart under the roots of the nearest clump of everlasting flowers, then if that clump was pulled up the reptile would make a rush for the next. They also frequented rocks beneath which they could seek refuge. When I shot one on a boulder and it rolled off, two other skinks I had failed to see dashed at it, "fighting it" said my gunbearer who was standing six feet from them.

Mabuya hildae sp. nov.

Type. M.C.Z. No. 50684, an adult female from the Nyika Plateau above Nchenachena, at 7000 feet, northwest of Lake Nyasa, Nyasaland. Collected by Arthur Loveridge, November 17, 1948.

Paratypes. M.C.Z. Nos. 50685–91 and an uncatalogued juvenile, being four ♂♂, two ♀♀, and two juveniles, from the same general region as the type but at altitudes ranging from 7000 to 8000 feet. Collected by Miss Hilda Sloan, who secured the first specimen, and Arthur Loveridge between November 11 and 17, 1948.

Diagnosis. Subocular resting on the labials, a primitive character that distinguishes *hildae* from all other members of the genus in Nyasaland except a variant of *striata*. Midbody scale-rows 38–40, the dorsals strongly bicarinate or tricarinate in the young but tricarinate in adults, sometimes obtusely. Most closely related to the Mlanje species described below, and possibly to *brauni* Tornier of the Ukinga Mountains at the northern end of Lake Nyasa, Tanganyika Territory.

From *M. varia* and its race occurring on the Nyika, *hildae* is most readily recognized by having no white lateral line, and, besides the subocular and other characters, by having more numerous supraciliaries and more scales around midbody.

Description. Supranasals in contact behind the rostral; centre of nostril posterior to (in type and 6 paratypes), or directly above (2) the vertical of the suture between rostral and first labial; postnasal not (type and 6), or barely (2), in contact with the second upper labial; anterior loreal in contact with the first and second (type and 5), first, second and third (1), second only (1), or second and third (1) labials; supraoculars 4, first smallest, second largest; supraciliaries 5, first usually smallest, second largest; subocular scarcely narrowed inferiorly, *not reaching the lip*, resting on the fifth and sixth (M.C.Z.

50691), sixth (type and 3), sixth and seventh (3), or seventh (1) labial (M.C.Z. 50688); lower eyelid with a transparent disk that is subequal to, or larger than, the ear-opening, which has 2 (type and 8 sides) or 3 (8 sides) more or less acuminate lobules projecting from its anterior border; frontonasal in contact with (type and 6) or separated from (2) the frontal; frontal in contact with the first, second and third (2) or second and third (type and 6) supraoculars; frontoparietals smaller than the interparietal, behind which the parietals are separated (type and 6) or meet (2); nuchals posteriorly multicarinate or smooth.

Midbody scale-rows 38 (2 paratypes) or 40 (type and 6); dorsals strongly bicarinate or tricarinate in young, tricarinate in (type) adults, sometimes obtusely; preanals not or but slightly enlarged; scales on soles strongly spinose; subdigital lamellae unicarinate and serrate; toes of the adpressed hind limb fail to meet (type and M.C.Z. 50685) in largest specimens, or overlap the fingers (4), wrist (1), or elbow (1) of the backward pressed forelimb.

Color. Type ♀ following preservation in formalin. Above, black, a pale, faintly indicated, dorsolateral line arises in the supraocular region and extends backwards towards the hind limb. Below, uniformly plumbeous with some black flecking in middle of abdomen and a whitish circumanal area.

♂ adult (M.C.Z. 50686) as recorded in life. Above, head pale brown, the supraoculars and parietals mottled with black; subocular and both upper and lower labials uniformly cream colored; back and flanks black longitudinally flecked with pale brown, each spot with a more or less light center; a pale brown vertebral stripe commences in the scapula region and extends backwards on to the tail; a cream-colored dorsolateral stripe begins on the supraocular and terminates on base of tail; flanks with irregular cream-colored flecks in more or less longitudinal series; tail (missing). Below, pure grayish white, lower jaws and throat anteriorly flecked with black; chest, centre of belly, and circumanal region with faint traces of salmon-pink.

In all the young and smaller adults the black flecking on the gular region is very conspicuous.

Size. Total length of type ♀ (M.C.Z. 50684), 150 (87 + 63) mm., but tail regenerated; length of paratype ♂ (M.C.Z. 50687), 121 (50 + 71) mm., but surpassed in head and body length by one (M.C.Z. 50686) of 64 mm.

Breeding. In both females examined the ova are small.

Enemies. One, too damaged to catalogue, was recovered from the

stomach of a Harrier (*Circus macrourus*).

Habitat. The largest, but tailless, male, first of the series to be taken, was captured near the summit of a rock-strewn mountain by Miss H. L. Sloan. As all the lizards caught previously were *varia*, I had assumed it was the only skink present. Stimulated by this find I kept a constant lookout for the new skink. On November 16, following two and a quarter days of mist and rainstorms, I found one basking at noon beside the main Kaulime path about four miles west of camp. At 2.30 P.M. the same day another young one was basking outside my tent. At 11 A.M. the following day the type was seen resting on the excavated soil at the entrance of a rodent burrow, down which it dashed, and from which we dug it. The burrow was on an open mountainside.

Mabuya varia nyikae subsp. nov.

Type. M.C.Z. No. 50860, an adult female from the Nyika Plateau above Nchenachena, at 7000 feet, northwest of Lake Nyasa, Nyasaland. Collected by Arthur Loveridge, November 1, 1948.

Paratypes. M.C.Z. Nos. 50861–3 and two uncatalogued, being four ♂♂ and one ♀ with similar data to the type but taken between November 1 and 8, 1948.

Diagnosis. This montane form differs from typical *varia*, of which topotypes (alt. 250 feet) and abundant material is available for comparison, in the centre of *nyikae's* nostril being directly above the vertical of the rostral-labial suture in five of the six specimens; reduction in supraciliaries; increase in scale-rows which are 34–36 (whereas 150 *varia* taken between sea-level and 6000 feet have 30–34); shorter limbs, for the toes of the adpressed hind limb fail to meet the backward-pressed forelimb in both females and only meet the fingers in the males; more slender habitus; and darker coloration, especially on chin and throat which are plumbeous in all but one of the *nyikae* series.

Description. Supranasals in contact behind the rostral; centre of nostril directly above (type and 4), or slightly posterior to (1), the vertical of the suture between rostral and first labial; postnasal not in contact with the second upper labial; anterior loreal in contact with the first and second labials; supraoculars 4, first smallest, second largest; supraciliaries 3 (1 side), 4 (9 sides, one of which is type), or 5 (2 sides, one of which is type), first usually smallest, second largest;

subocular slightly narrowed inferiorly, reaching the lip between the fourth and fifth (type and 4) or fifth and sixth (1) labials; lower eyelid with a transparent disk that is subequal to, or larger than, the ear-opening, which has 2 (type and 2), or 3 (2), rarely not discernible (1), more or less acuminate lobules projecting from its anterior border; frontonasal in contact with the frontal; frontal in contact with the second and third supraoculars; frontoparietals subequal to, or smaller than, the interparietal, behind which the parietals meet; nuchals multicarinate, sometimes only posteriorly.

Midbody scale-rows 34 (3) or 36 (type and 2); dorsals strongly tricarinate; preanals not or but slightly enlarged; scales on soles strongly spinose; subdigital lamellae unicarinate and serrate; toes of the adpressed hind limb fail to meet (type and other ♀), or overlap the fingers (4 ♂♂) of the backward pressed forelimb.

Color. Above, blackish brown (instead of the reddish brown of typical *varia*) with the usual pattern and markings. Below, chin and throat plumbeous (except in one paratype); breast, belly and tail more or less gray (except in one paratype).

Size. Total length of type ♀ (M.C.Z. 50860), 127 (55 + 72) mm., of paratype ♂ (M.C.Z. 50861), 123 (48 + 75) mm.

Breeding. On November 1 the type held small, but developing ova; on November 8 a paratype ♀ held ova measuring 8 x 6 mm.

Parasites. No mites present beneath forelimbs whose axillary pits are not developed.

Enemies. The undigested tail of a skink was recovered from the stomach of a snake (*Psammophylax t. variabilis*), evidence of the advantage afforded the lizard by a readily discarded caudal appendage.

Habitat. The type was taken near the top of Nchenachena Falls, another was removed from a mouse hole down which it had been seen to retire. It was secretiveness, rather than scarcity, that resulted in my securing so small a series. When the sun offered sufficient inducement, these solitary skinks would emerge to bask at the entrance of the rodent burrows that were scattered over the rolling grasslands. It needed sharp eyes to detect them at a distance for, at the approach of danger, they would turn back into their retreat from which it was usually a lengthy business to dig them out.

Mabuya varia varia (Peters)

Euprepes (*Euprepis*) *varius* Peters, 1867, Monatsb. Akad. Wiss. Berlin, p. 20: Tete, Mozambique.

Mabouia varia Günther, 1893 (1892), p. 555; Johnston, 1897, p. 361.
Mabuia varia Boulenger (part), 1897e, p. 800; Johnston, 1898, p. 361; Mitchell, 1946, p. 27.

1 (A.M.N.H. 67839) Zomba Plateau. v.–vi.46.
1 (A.M.N.H. 67811) Likabula River. vi–vii.46.
4 (M.C.Z. 50814–6) Misuku Mtns. 27–30.ix.48.
3 (M.C.Z. 50817–9) Nchisi Mtn. 30.xi.48.
1 (M.C.Z. 50820) Chitala River. 14.xii.48.
1 (M.C.Z. 50825) Mtimbuka. 10.ii.49.
1 (M.C.Z. 50826) Chowe. 12.ii.49.
7 (M.C.Z. 50821–4) Zomba Plateau. 2–7.ix.48.
1 (M.C.Z. 50827) Chiradzulu Mtn. 31.viii.48.
6 (M.C.Z. 50828–34) Cholo Mtn. 11–18.iii.49.
9 (M.C.Z. 50835–43) Likabula R. 2–5.viii.48.
12 (M.C.Z. 50844–53) Lichenya Plateau. 8–20.viii.48.
2 (M.C.Z. 50854–5) Ruo River. 1.iv.49.
11 (M.C.Z. 50856–9) near Tete, M. 10–28.i.49.
1 (M.C.Z. 50300) Beira, M. 17.vii.48.

Records. Blantyre (M.ms.); Chikwawa (M.ms.); Chiromo (M.ms.); Fort Johnston (M. ms.); Karonga to Kondowe (B); Limbe (M.ms.); Misuku (as Masuku) Mtns. (B); Mlanje Mtn. (M.ms.); Monkey Bay (M.ms.); Nkata Bay to Ruarwe (B); Nyika district (B); Port Herald (M.ms.); Shire Highlands (G); Zomba (M).

Native names of the Tete Variable Skink. *Mbulundwe* (Yao, but generic); *mbulunzi* (Chewa; Ngoni); *mpumapuma* (Nyungwe); *nalikwampwilo* (Nyanja); *shioloe* (Misuku, but generic).

Remarks. In the following summary of variation, specimens from Lichenya Plateau at 6,000 feet, though darker, do not appear to differ in lepidosis from the rest of the series taken at lower altitudes.

Variation. Supranasals in contact (56 specimens), or separated (4), behind the rostral; centre of nostril posterior to (60) the vertical of the suture between rostral and first labial; postnasal not (60) in contact with the second upper labial; anterior loreal in contact with the first and second (38), first, second and third (18), or second and third (3) labials; supraoculars 4, first smallest, second largest; supraciliaries 4 (18 sides) or 5 (80 sides), first usually smallest, second largest; subocular slightly narrowed inferiorly, reaching the lip between the fourth and fifth (42) or fifth and sixth (19) labials; lower eyelid with a transparent disk that is subequal to, or larger than, the ear-opening, which has 2 (30), 3 (26), 4 (M.C.Z. 50814 only), or none (4), dis-

cernible more or less acuminate lobules projecting from its anterior border; frontonasal in contact with (50), or separated from (9, in three instances by an azygous scale split off from) the frontal; frontal in contact with the first, second and third (15 sides), or second and third (105 sides) supraoculars; frontoparietals subequal to, or smaller or larger than, the interparietal, behind which the parietals meet (55) or are separated (M.C.Z. 50859 and three Lichenya Plateau skinks); nuchals, when not broken up, sharply or obtusely multicarinate, occasionally smooth.

Midbody scale-rows 30 (7), 32 (16), or 34 (38); dorsals strongly tricarinate; preanals not or but slightly, rarely distinctly, enlarged; scales on soles strongly spinose; subdigital lamellae unicarinate and serrate; toes of the adpressed hind limb just meet (5), or overlap the fingers (14), wrist (12), elbow (21), or reach the axilla of the backward-pressed forelimb.

Size. Largest Nyasaland ♂ (M.C.Z. 50830), 150 (55 + 95) mm.; ♀ (M.C.Z. 50815), 168 (70 + 98) mm.; largest Mozambique ♂ (Duplicate) 131+ (53 + 78+) mm. but tail regenerated; ♀ (M.C.Z. 50856), 178 (65 + 113) mm.

Breeding. Between August 2–5, at Likabula, 3 ♀ ♀ held large ova, a fourth well-scaled embryos; between August 8–20, on Lichenya, 4 ♀ ♀ held small ova, the largest 4 mm. in diameter; between September 2–7, on Zomba, 5 ♀ ♀ held developing ova; on September 27, in the Misukus, 2 ♀ ♀ held well-developed embryos numbering 8 and 14 respectively; on November 30, Nchisi Mtn., 2 ♀ ♀ held 7 mm. diameter ova in which unpigmented embryos were recognizable; between January 10–28, near Tete, 4 ♀ ♀ held small ova, the largest 4 mm. in diameter; between March 11–18, on Cholo, of 4 ♀ ♀ examined 2 held *very* small ova (? spent), 1 large ova, and the fourth gave birth to a young one (M.C.Z. 50828) measuring 49 (21 + 28) mm. in the field.

Diet. Two 20 mm.-long, smooth-skinned caterpillars in a Cholo skink.

Enemies. Recovered from the stomachs of a Wolf Snake (*Lycophidion c. capense*) at Cholo, a Hissing Sand-Snake (*Psammophis s. sibilans*) and a Vine-Snake (*Thelotornis k. oatesii*) at Mtimbuka.

Habitat. Principally on boulders at Nchisi, Chowe, and on the Lichenya Plateau where on August 20 — a sunny and moderately warm morning after a spell of cold weather — between 10.30 A.M. and 12.30 P.M. I shot 11, of which 9 were males, others were living

under the dried-out shingles of a derelict cottage.

On September 4, on Zomba Plateau, a torpid male, too chilled to move, was found beneath a fallen tree-trunk; at Chire River Bridge, Northern Rhodesia, both old and young skinks were sheltering under charred logs in the fire-swept bush; the Chiradzulu specimen was basking at a height of six inches from the ground on one of the trees forming part of an avenue; at Likabula these reptiles were fairly common upon the dessicating vegetation hoed from the footpaths.

The Tete topotypes lived among the small dried leaves drifted about the bases of the bushes that cover much of the dessicated countryside around Kasumbadedza. Undoubtedly influenced by the daily temperatures of 100° in January, they were only in evidence for a short time after sunrise, and again for an hour or two before sunset.

Ablepharus wahlbergii (Smith)

Cryptoblepharus wahlbergii A. Smith, 1849, Illus. Zool. S. Africa, Rept., App., p. 10; Natal, South Africa.

Ablepharus wahlbergii Boulenger, 1887a, p. 350; 1891a, p. 306; 1891b, p. 313.

Ablepharus carsonii Boulenger (*not* Boulenger of 1894), 1897e, p. 800; Johnston, 1898, p. 361

17 (M.C.Z. 50919–30) Nchisi Mtn. 27.xi.–8.xii.48.
1 (M.C.Z. 50931) Dedza. 21.xii.48.
2 (M.C.Z. 50932–3) Mtimbuka. 9.ii.49.
1 (M.C.Z. 50934) Chowe. 12.ii.49.
1 (M.C.Z. 50935) Kausi Village. 25.ii.49.
1 (M.C.Z. 50936) Cholo Mtn. 17.iii.49.
4 (M.C.Z. 50937–40) near Tete. 18–25.i.49.

Records. Lake Nyasa (B); "Nyika Plateau" (as *carsoni*, B). Through the courtesy of Dr. H. W. Parker, I have been able to examine the skink (B.M. 97.6.9.66) allegedly taken on the Nyika Plateau between 6000 and 7000 feet by Alexander Whyte, and referred to *carsoni* (*sic*) by Boulenger. It is a quite typical *wahlbergii*, having an interparietal distinct from the fused frontoparietals.

I also saw the unique type (B.M. 94.12.20.5 renumbered 1946.8.18. 58) of *carsonii* Boulenger (1894e, Proc. Zool. Soc. London, p. 735, pl. xlix, figs. 4–4a), described from Fwambo, British Central Africa, i.e. Fwamba, Northern Rhodesia. It is a small skink with a hairlike dark vertebral line; in its first supraocular (about equal in length to the other two) it does not differ from *wahlbergii*, and I surmise that

its sole distinguishing character — the fused interparietal — will prove to be an individual aberration when some Rhodesian can be persuaded to secure a series at Fwamba, near Abercorn.

Native names of Wahlberg's Snake-eyed Skink. *Bwezananga* (Chewa); *nshinya* (Nyungwe).

Variation. Prefrontals separated (24) or in contact (3 ex. Nchisi and Mtimbuka respectively); midbody scale-rows 24–28 (24 in M.C.Z. 50937 only; 28 in M.C.Z. 50934 only); lamellae beneath fourth toe 12–15.

Unfortunately precise notes were not made of the coloration of the two largest Nchisi skinks which were a rich red beneath. Though familiar with the rosy coloring of *wahlbergii* (? breeding) at times, I felt that these huge and handsome Nchisi skinks must represent something new. Their lepidosis, however, scarcely supports this view though all seventeen Nchisi skinks have 26 midbody scale-rows in contrast to the 22–26 one usually encounters in the countries further north and for which the subspecific name *massaiensis* Angel, 1924, is available, though its employment is inadvisable in the present state of our knowledge.

Color. The tails of very young ones are faintly blue; see note above also.

Size. Largest ♂ (M.C.Z. 50920), 94 (46 + 48) mm.; largest ♀ (M.C.Z. 50919), 93+ (52 + 41+) mm. the tail regenerating. These dimensions are equalled, or even surpassed, by one or two unusual individuals from Northern Rhodesia, Tanganyika Territory, and Kenya Colony. In the present series the next largest is a gravid ♀ (M.C.Z. 50932) of 89 (40 + 49) mm.

Breeding. On November 30, at Nchisi, two hatchlings measuring 46 (21 + 25) mm. and 55 (23 + 32) mm. respectively, were taken within a yard of each other at 11.30 A.M. when the sun shone after a downpour.

On January 18, near Tete, one of three found in a rotting log, reflected the smaller size of the local *wahlbergii* by measuring only 33 (16 + 17) mm.

On January 25, at Boroma near Tete, a young one (M.C.Z. 50939), measured 46 (21 + 25) mm. — now only 44 (20 + 24) mm., due to contraction on preservation.

Clearly the two eggs laid by this species hatch during the rains (mid-November to mid-March or April in normal years). In the gravid ♀ mentioned above, the eggs were about half-developed in February.

Habitat. At Nchisi among dead leaves on the mountainside, in the evening on paths; at Dedza on the road; at Mtimbuka among rubbish at the base of a baobab; at Kausi several were seen sharing the habitat described for *Riopa sundevallii.*

Scelotes arnoldi (Hewitt)

Sepsina arnoldi Hewitt, 1932, Ann. Natal Mus., **7**, p. 112, figs.: "Vumbu Mountains," i.e. Vumba Mountain, at 5600 feet, 20–30 miles south of Umtali, Southern Rhodesia.

♀ (A.M.N.H. 6782) Lichenya Plateau. 24.vi.–18.vii.46.

Records. New to Nyasaland, where it was taken on Mlanje Mountain at about 5800 feet, this is the second known example of the species.

Variation. Midbody scale-rows 22; supraciliaries 5 or 6; fingers 5; toes 5; lamellae beneath fourth toe 11.

Color. Apparently only in color does this specimen differ from the detailed redescription and figures of the type given by FitzSimons (1943, p. 204, figs. 84–85).

Size. Total length of this apparently spent ♀, 71+ (38 + 33+) mm., tip of tail missing.

Scelotes tetradactylus tetradactylus (Peters)

Sepsina (*Rhinoscincus*) *tetradactyla* Peters, 1874, Monatsb. Akad. Wiss. Berlin, p. 374: Zanzibar Coast.

Sepsina tetradactyla Günther, 1893 (1892), p. 555; Boulenger, 1894e, p. 725; Bocage, 1896a, p. 103; Johnston, 1897 and 1898, p. 361; Nieden (part), 1913c, p. 90.

Scelotes tetradactyla Barbour & Loveridge, 1928c, p. 168.

2 (M.C.Z. 50941–2) Lujeri River. 1 & 11.iv.49.

Records. Mlanje Mountain (Nieden); Shire Highlands (Günther); Zomba (B. & L.). Nieden's second specimen from Marungu, Belgian Congo, is presumably referable to the more attenuated western form (*S. t. hemptinnei* (Witte)).

Native name of the Four-toed Skink. *Purundwe* (Nyanja).

Variation. Midbody scale-rows 24; supraciliaries 4 or 5; fingers 4; toes 5; lamellae beneath fourth toe 3.

Size. Total length of ♂ (M.C.Z. 50941), 124 (88 + 36) mm.

Diet. The stomach contents of one have been identified for me by

Dr. Floyd Werner as: 22 worker termites, mostly large, together with an adult of about one-and-three-quarter-inch wingspread; also a roach with wingspread of about an inch.

Habitat. I personally captured the male in dry, somewhat sandy, soil beneath the roots of an enormous tree stump at edge of gallery forest fringing the river near the Lujeri Estate cattle byre. Despite intensive search on successive days in this and the surrounding slopes of Mlanje, no more were found. Though the specimen was shown to numerous natives, who were urged to search for it, the only other example of this rare skink was brought in just half an hour before our departure.

Riopa sundevallii (Smith)

Eumices (*Riopa*) *sunderallii* (misprint *sic*) A. Smith, 1849, Illus. Zool. S. Africa, Rept., App. p. 11; "Country eastward of Cape Colony" i.e. Natal, Union of South Africa.

Mochlus punctulatus Günther, 1864, Proc. Zool. Soc. London, p. 308: Zambesi Expedition.

Lygosoma sundevallii Boulenger, 1887a, p. 307; 1891a, p. 306; 1891b, p. 313; Günther, 1894a (1893), p. 618; Johnston, 1897 and 1898, p. 361.

5 (M.C.Z. 50876–9) Mtimbuka. 9.ii.49.
36 (M.C.Z. 50880–909) Kausi Village. 25.ii.49.
1 (M.C.Z. 50918) Mpimbe, Shire River (B. L. Mitchell).
11 (M.C.Z. 50910–7) near Tete, M. 14–19.i.49.

Records. Lake Nyasa (B.;G). This locality, as shown by the footnote, was about midway between my Mtimbuka, Lake Nyasa, and Kausi Village, Lake Malombe, but whether the "Zambesi Expedition" material taken by Sir John Kirk came from near the lake (in which case my Mtimbuka material is topotypic of *punctulatus*) or from the Zambezi (which would make the Tete series topotypic) remains uncertain.

Native names of Sundevall's Skink. *Jengamauta* (Yao); *nyaukaruso* (Nyungwe).

Variation. Nostril between two nasals and a supranasal or separated from the latter by a narrow rim which *very rarely* unites the two nasals so that the nostril might be said to be in a semi-divided nasal; parietals bordered by 5 (7), 6 (26), 7 (17) or 8 (2) nuchals, those in the first category might often be called "enlarged"; midbody scale-rows 26 (39), 27 (1) or 28 (12); limbs pentadactyl except for the

left fore and hind foot of M.C.Z. 50890, apparently a congenital condition and not the result of an accident; lamellae under the fourth (longest) toe 10 (6), 11 (11), 12 (20) or 13 (10).

Color. With the exception of the large black-and-white flecked specimen (M.C.Z. 50918) from Zomba District, the entire series is more or less uniformly brown above, though a lens reveals an obsolescent dark speck on each scale. Strikingly different as are these two color forms, both are fairly well represented in a series of five skinks (M.C.Z. 50284–8) that I took near Dar es Salaam, Tanganyika Territory, during the outward voyage.

Size. The largest (M.C.Z. 50918) is a dried specimen of about 190 (90 + 100) mm.; the next largest ♂ and ♀ (M.C.Z. 50886–7) both measure 80 mm. from snout to anus, but have regenerating tails.

Breeding. Ova minute in January and February, but only a couple of females examined.

Parasites. Trombiculid mites (*Ascoschongastia* sp.) were common between the toes of Tete skinks, less frequently found in the groin.

Enemies. One removed from the stomach of a File Snake (*Mehelya nyassae*) at Mtimbuka, another from an Owlet (*Glaucidium perlatum*) at Kasumbadedza near Tete.

Habitat. I took the entire Kausi series in about three hours following a shower. It was very noticeable, however, that the majority were on the east side of the trees where the soil was dry and dusty, the western aspect of the same trees had caught the rain and the ground was more moist. The skinks were beneath rubbish heaped against the trees, between the buttress roots, or in their hollow bases. Elsewhere we ound them beneath logs or rubbish.

Riopa modesta modesta (Günther)

Sepacontias modestus Günther, 1880, Ann. Mag. Nat. Hist. (5), **6**, p. 235: Mpwapwa, Ugogo, Tanganyika Territory.

1 (A.M.N.H. 67831) Kasungu. 18–23.viii.46.

Records. This, the first record of the occurrence of *modesta* in Nyasaland, constitutes a southward extension of its range by over 400 miles.

Variation. This specimen does not appear to differ from our topotypic material with which it has been compared. Midbody scale-rows 26: though the range for both *modesta* and *sundevallii* is 24–28, *modesta* is more often 24–26, while *sundevallii* is usually 26–28.

Riopa johnstoni (Boulenger)

Lygosoma johnstoni Boulenger, 1897e, Proc. Zool. Soc. London, pp. 800, 801, pl. xlvi, fig. 1: Nyika Plateau, Nyasaland; Johnston, 1898, p. 361.

Records. This species is still known only from the holotype (Brit. Mus. 97.6.4.65, renumbered as 1946.8.21.90) collected over fifty years ago by Alexander Whyte. Most of Whyte's reptiles and amphibians attributed to the Plateau appear to have been taken in the neighborhood of Livingstonia at 6000 feet or below. According to Boulenger (p. 800) Whyte collected between 6000 and 7000 feet, but on the same page he fails to list *johnstoni* as occurring on the Plateau, apparently checking it instead as Nyika District through inadvertence. Though constantly on the lookout for it during the three weeks we spent on the Nyika at 7000 feet, we failed to find it though it is quite possible it occurs sparsely in some sheltered hollow.

Remarks. When passing through London I took the opportunity to reëxamine the holotype of *johnstoni*, a species that eventually may prove to be only a race of the closely related *anchietae*. At present *Riopa johnstoni* is distinguished by having only a single (2 or 3 in *anchietae*) toe on each forelimb, and 2 (3 in *anchietae*) toes on each hindlimb.

I extend the previous range of toes in *anchietae* because of an adult and two halfgrown specimens in the British Museum (1906.7.6.1–3) which have 2 (adult) and 3 (young) toes on the forelimbs. All three come from Nandi, 6000 feet, Kenya Colony. Other material,

4 (B.M. 24.8.28.2–5) Cherangani Hills, K.C.
1 (B.M. 26.4.19.4) Lumbumbashi near Elisabethville, B.C.
1 (B.M. 93.12.27.8) Caconda, Angola.

all had 3 toes on the front limbs and 3 on the hind ones.

Melanoseps ater misukuensis subsp. nov.

Native name of Misuku Limbless Skink. *Mbulisi* (Misuku).

Type. M.C.Z. No. 50945, a gravid ♀ from the edge of Matipa Forest, Misuku Mountains, 6000 feet, northern Nyasaland. Collected by Arthur Loveridge, October 3, 1949.

Paratypes. M.C.Z. Nos. 50946–69 and five uncatalogued duplicates, all with data similar to that of the type except that they were collected between September 23 and October 15, 1950.

Diagnosis. In my (1942e, Bull. Mus. Comp. Zool., **91**, pp. 359–360) key to the genus, this form falls to section 4 (*a. ater* and *a. matengoensis*). With the typical form it agrees in lepidosis but differs by lacking the uniform black belly colouring. (*vide infra*).

It agrees with *a. matengoensis* from the highlands lying east of Lake Nyasa in having from 22–24 midbody scale-rows, but in *misukuensis* these are normally 22 (24 examples) and less usually 24 (6 ex.), while in *matengoensis* they are normally 24 (11 ex.) and rarely 22 (1 ex.). Moreover, in color, the chin and belly of *misukuensis* is usually striped longitudinally (14 ex.) though in older examples this tends to be restricted to the sides of the belly (7 ex.) and is only white in the very oldest specimens (5 ex.). In *matengoensis* the underside is white in all twelve cotypes (whose lengths from head to anus range from 87 to 166 mm.).

Description. Supranasals in contact (in all); supraoculars 3 (on both sides of all paratypes); supraciliaries 4 or 5 (in all); prefrontals absent (in all); frontoparietals absent (in all except M.C.Z. 50969); interparietal the largest head shield (except in M.C.Z. 50969); midbody scale-rows 22 (22–24 in paratypes; see *Diagnosis* above).

Color in life. ♂ paratype (M.C.Z. 50952). Above, uniformly black; below, white, each scale in the abdominal region bearing a dark spot so that they form longitudinal rows; tail uniform black like back. ♀ paratype (M.C.Z. 50955), gravid. Above, uniformly black; below, salmon pink; tail pinkish white, each scale almost obscured by its gray centre.

Color in alcohol. ♀ holotype (M.C.Z. 50945). Above, also beneath tail, uniformly iridescent black (as in all paratypes); otherwise below, from chin to anus, pure white (on account of age, longitudinally striped in the majority of paratypes as follows: — underside striate in all young under 132 mm. in length from snout to anus (viz. 86, 90, 112, 113, 119 (irregular), 121 and 131 mm.); but these striations may be retained until 163 mm. (viz. 138, 142, 145, 150, 153, 158 and 163 mm.); though in specimens of 132 mm. and over they tend to disappear along the middle line (viz. 132, 142, 150, 154, 157, 161 and 163 mm.); and are entirely absent in five examples which include the two largest, one of which has been made the type (viz. 144, 144, 162, 168 and 178 mm.).

Size. Total length of type ♀ (M.C.Z. 50945), 239 (178 + 61) mm.; of largest perfect paratype ♂ (M.C.Z. 50961), 184 (138 + 46) mm. Apparently males are smaller than females for dissection of the sixteen

largest skinks (142–178 mm. from snout to anus, average 155.6 mm.) revealed that all were females, mostly gravid. At times it is next to impossible to say whether the tail of one of these naturally stumpy-tailed skinks is regenerated or not. But by dividing the caudal length into that of the head and body of twenty-five specimens (five tailless duplicates being eliminated) it is seen to be included with a scarcely broken sequence from 2.5 to 4.0 times, there is then one with 4.6 and another with 4.9 times (the latter looking as if it might be regenerated), while the remaining four (of 5.2, 6.2, 8.5 and 9.6 times) are certainly reproduced. It seems reasonable to assume that the range is 2.5 to 4.6 times as in *a. rondoensis* Loveridge which was based on a large series. In *a. misukuensis* this range is covered by females alone, the two known males (2.7 and 3.0 times) exhibiting no sexual dimorphism in this respect.

Breeding. As indicated above, almost all females taken between mid-September and mid-October were gravid, usually holding about three elongate eggs, very approximately 10 x 5 mm., some of which contained tiny embryos.

Habitat. On October 3, I personally captured the three largest females, all gravid, beneath a felled tree-trunk lying at the forest-edge in a clearing illegally made for cultivation. The log was in full sunlight as it was noon. Most of the soil beneath the log was dry, but there was a moist patch about a foot in length and it was in this confined space that the three skinks were lying, the largest ten (now nine-and-a-half) inches, the others but little shorter.

Another female was taken in the early morning on a path passing through the forest, another beneath a log lying beside the path, a third near a stand of wild bananas, while the male, whose color is described above, was beneath a slab of rock on an eroded slope surrounded by scrubby secondary woodland.

Melanoseps ater ater (Günther)

Herpetosaura atra Günther, 1873, Ann. Mag. Nat. Hist. (4), **12**, p. 147: Zambezi.

♀ (M.C.Z. 50944) Misuku Mountains. 5.x.48.
?♂ (M.C.Z. 50943) Vipya Plateau. 17.ix.48.

Records. Both genus and species are new to Nyasaland. It will be noted that one of the specimens came from the Misuku Mountains in

which range is the Matipa Forest, type locality of the race described above. The specimen, however, was brought to camp by a native who may have fetched it up from below or from another ridge.

Native names of the Black Limbless Skink. *Bilitzi* (Nyanja and Ngoni); *malinga* (Ngoni); *malingo* (Timbuka); *mbitu* (Yao); several being due to confusion with snakes of the genus *Typhlops*.

Variation. Supranasals in contact; supraoculars 3; supraciliaries 4–5; midbody scale-rows 22.

Size. Above and below, uniformly black.

Breeding. On October 5, the female was gravid.

Habitat. The Vipya specimen was taken by the stream and bridge immediately below MacDonald's Camp.

GERRHOSAURIDAE

Gerrhosaurus validus validus Smith

Gerrhosaurus vallidus (*sic*) A. Smith, 1849, Illus. Zool. S. Africa, Rept., App., p. 9: Towards sources of Orange River, South Africa.

Gerrhosaurus robustus Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 618: Tete, Mozambique.

Gerrhosaurus validus Mitchell, 1946, pp. 27, 41.

♀ (M.C.Z. 50970) near Mtimbuka. 16.ii.49.
juv. (M.C.Z. 50971) near Mpatamanga Bridge. 31.i.49.
♂♂, ♀ (M.C.Z. 50972–4) near Tete, Mozambique. 6.i.49.

Records. Salima (M). Mr. Mitchell, who so recently added the Giant Plated-Lizard to the Nyasaland fauna, believes the species also occurs at Monkey Bay and at Zomba.

Native names of the Giant Plated-Lizard. *Damalango* (Yao); *kwawhe* (Cewa, *fide* Mitchell); *kwaowa* (Nyungwe, but also applied to *major grandis*).

Variation. Supraoculars 4; supraciliaries 5–6; dorsal scale-rows transversely 30–32; dorsal scale-rows longitudinally 50–56; ventral scale-rows transversely 14–16; ventral scale-rows longitudinally 40–45; femoral pores 14–22; lamellae beneath fourth toe 19–21.

While involving slight extensions of the range as given in the generic revision (*vide* Loveridge, 1942d, pp. 492–494), these figures do not approach those of the Angolan race *skoogi*.

Size. Larger ♂ (M.C.Z. 50973), 508+ (230 + 278+) mm.; larger ♀ (M.C.Z. 50974), 584 (230 + 354) mm., the latter considerably surpassing all records for this sex.

Breeding. Ova small on January 6 and February 16. Mitchell records a Salima female as almost ready to lay in September.

Diet. Fruit and leaves were recovered from several stomachs.

Parasites. Worms (*Tachygonetria* and *Thelandros* spp.), of which one has been described as new by Mr. J. T. Lucker, present in the intestinal tracts of specimens from near Mpatamanga and Tete.

Habitat. When brought to camp by a native, the adult Tete topotypes of *robustus* were already badly decomposed, their condition being due to the daily temperatures of 100° and over. These climatic conditions also made plated lizards loth to leave their rock fissures except for brief periods after dawn and before sundown. Even then they remained close to their retreats, into which they crawled at the first sign of danger. Several large ones were seen in addition to the three I shot, but in vain I awaited their re-emergence.

Gerrhosaurus major grandis Boulenger

Gerrhosaurus grandis Boulenger, 1908, Ann. Natal Mus., **1**, p. 225, pl. xxxvi: Zululand.

♂ ♀ (A.M.N.H. 67809–10) Likabula River. vi.–vii.46.
♂ ♀ (M.C.Z. 50975–6) Likabula River. 6.viii.48.

Records. New to Nyasaland, though in the London Zoological Gardens I recently saw a Nyasaland series labeled *validus*. Its occurrence was to be expected as this form is known from the surrounding territories of Tanganyika, Mozambique, and Northern Rhodesia (for full account *vide* Loveridge, 1942d, pp. 500–501).

Variation. Supraoculars 4; supraciliaries 4–5; dorsal scale-rows transversely 18; dorsal scale-rows longitudinally 31–34; ventral scale-rows transversely 10; ventral scale-rows longitudinally 33–34; femoral pores 10–15; lamellae beneath fourth toe 13–15.

Color pattern. Conforms to that of *grandis* and not of *major*.

Size. Larger ♂ (M.C.Z. 50975), 455 (200 + 255) mm.; larger ♀ (M.C.Z. 50976), 390 (215 + 175) mm.

Breeding. Ova small in June or July, but the August ♀ held three large eggs approximately 27 x 23 mm. and the testes of the ♂ taken the same day measured about 21 x 9 mm.

Habitat. The pair I obtained were in the habit of basking half out of a tunnel near the summit of a cement-hard, six-foot-tall termitarium that, surmounted by a small scrubby tree, had its base hidden by dead

grass. Beside the base ran a trail worn by the bare feet of our boys as they passed from tent to kitchen, yet the large lizards passed unnoticed until almost the end of the fortnight that we spent at this camp.

Gerrhosaurus major major Duméril

Gerrhosaurus major A. Duméril, 1851, Cat. Meth. Coll. Rept., p. 139: Zanzibar.

♂ (M.C.Z. 50977) near Tete. 14.i.49.

Records. This is the East African coastal form and only twice recorded from Mozambique, of which the Chifumbazi record of Sternfeld (1911c, p. 417) may be *grandis* if he is referring to the Chifumbazi southwest of Lilongwe, Nyasaland. If correctly determined this form may well turn up in Nyasaland. To find it at Tete, which is only 250 feet above sea level, is not surprising.

Native name of Great Plated-Lizard. *Kwaowa* (Nyungwe, but applied also to *G. v. validus*).

Variation. Except that the dorsal scale-rows transversely are 16, and the femoral pores 11 + 11, the Tete specimen is within the range for this form given in the revision (*vide* Loveridge, 1942d, pp. 502–504).

Size. Not outstanding, viz. ♂, 463 (190 + 273) mm.

Breeding. Testes large.

Diet. Seeds in its stomach when brought in by a native.

Gerrhosaurus nigrolineatus nigrolineatus Hallowell

Gerrhosaurus nigro-lineatus Hallowell, 1857, Proc. Acad. Nat. Sci. Philadelphia, p. 49: Gaboon.

Gerrhosaurus nigrolineatus nigrolineatus Loveridge, 1942d, pp. 508–514 (generic revision).

4 (A.M.N.H. 67835–8) Kasungu. 19–23.viii.46.
♂ (A.M.N.H. 67813) Chibotela. 24.viii.–8.ix.46.
♀ (M.C.Z. 50978) Misuku Mountains. 16.x.48.
♀ (M.C.Z. 50979) Nchisi Mountain. 6.xii.48.
♂ (M.C.Z. 50981) Chitala River. 18.xii.48.
♂ (M.C.Z. 50987) near Tete, Moz. i.49.

Records. New to Nyasaland and Mozambique though common in Northern Rhodesia and Tanganyika Territory. One was seen at Nchenachena, but on account of its abundance elsewhere no effort was

made to obtain a series, a few being taken for locality or their unusual size.

Native names of the Black-lined Plated-Lizard. *Kakwasi* (Ngoni); *likwakwala* (Yao); *sambakwakwa* (Misuku); *tambalivilo* (Chewa); *zoromonda* (Nyungwe), but all undoubtedly applied to *f. flavigularis* also.

Variation. Supraoculars 4; supraciliaries 4, or 5 (on right side of A.M.N.H. 67813 only); dorsal scale rows transversely 20–22; dorsal scale-rows longitudinally 56–62; ventral scale-rows transversely 8; ventral scale-rows longitudinally 32–36; femoral pores 14–17, developed in both sexes; lamellae beneath fourth toe 15–18; head included in length from snout to anus 4.5 to 5 times.

Size. Largest ♂ (M.C.Z. 50981), and a record for the sex, 480 (160 + 320) mm.; largest ♀ (M.C.Z. 50979), 425* (160 + 265*) mm., but tail regenerated.

Breeding. Ova small on October 16 and December 6.

Gerrhosaurus flavigularis flavigularis Wiegmann

Gerrhosaurus flavigularis Wiegmann, 1828, Isis von Oken, col. 378: "Africa merid. Krebs." Günther, 1894a, (1893), p. 618; Boulenger, 1897e, p. 800; Johnston, 1897 and 1898, p. 361; Mitchell, 1946, pp. 28, 41.

Gerrhosaurus flavigularis flavigularis Loveridge, 1942d, pp. 516–520 (generic revision).

♀ (M.C.Z. 50980) Nchisi Mtn. 11.xii.48.
2 ♂♂, 2 ♀♀ (M.C.Z. 50982–5) Mtimbuka. 7–10.ii.49.
5 ♂♂, 6 ♀♀ (M.C.Z. 50988–97) near Tete. 6–28.i.49.

Records. Fort Hill (B); Nkata Bay to Ruarawe (B); "Nyika Plateau" (B); Shire Highlands (G). The possibility should be borne in mind that some of these may refer to *nigrolineatus* as laboratory examination is often required to separate them, and these quite distinct species may be found in the same locality.

Native names of the Yellow-throated Plated-Lizard are the same as those listed under *nigrolineatus* (*vide supra*).

Variation. Supraoculars 4; supraciliaries 5, or 4 (on left side of M.C.Z. 50992 only); prefrontals separated (13 ex.) or in contact (3); dorsal scale-rows transversely 20–22; dorsal scale-rows longitudinally 60–62; ventral scale-rows transversely 8; ventral scale-rows longitudinally 34–37; femoral pores in males 10–17, they are ill-developed and concealed beneath scales in females; lamellae beneath fourth toe

17–20; head included in length from snout to anus 4.8 to 5.8 times.

Size. Largest ♂ (M.C.Z. 50982), a record for the sex, 434 (126 + 308) mm.; largest ♀ (M.C.Z. 50994), 379 (106 + 273) mm., but exceeded in body length by a ♀ (M.C.Z. 50983), 372 (127 + 245) mm. with regenerated tail.

Breeding. On December 11, at Nchisi, a ♀ held four eggs measuring 21 x 11 mm. In January and February the ova were small in all eight females. On February 10, at Mtimbuka, five eggs measuring 20 or 21 x 14 mm. were found in sandy, black-cotton soil at the base of, and partly under, a baobab growing a hundred feet from the lakeshore. The eggs held partly pigmented embryos.

Diet. Two lizards were gorged with termites; three held large black crickets with, or without, grasshoppers; in several others were well-chewed remains of beetles some of which have been identified by my colleague, Dr. P. J. Darlington Jr., as Buprestids of the genus *Sphenoptera*, and Tenebrionids of two species. The only other identifiable food consisted of two small millipedes.

Parasites. Nematodes (*Abbreviata* sp., probably *varani*) in specimens from Nchisi and Tete were saved, but those in an Mtimbuka lizard were not preserved.

LACERTIDAE

Nucras intertexta ornata (Gray)

Teira ornata Gray, 1864e, Proc. Zool. Soc. London, p. 58: "South-eastern Africa (Dr. Kirk)," later given as Zambezi (*fide* Boulenger).

Lacerta cameranoi Bedriaga, 1886, Abhand. Senckenberg. Ges., **14**, p. 378, pl., figs. 2, 9, 11, 31: Tete, Mozambique.

Nucras tessellata Boulenger (not of Smith), 1887a, p. 52; 1891a, p. 306; Johnston, 1898, p. 361; Boulenger, 1920e, p. 24; 1921a, p. 382.

Nucras intertexta var. *Holubi* Boulenger (not of Steindachner), 1920e, p. 20; 1921a, p. 381.

juv. (M.C.Z. 50986) Mtimbuka. 10.ii.49.
♂ (M.C.Z. 50998) Ndirandi Mtn. 1.i.49.
2 ♂♂, 2 ♀♀ (M.C.Z. 50999–51002) near Tete. 14–19.i.49.

Records. Lake Nyasa (B). The two lizards from the Misuku (as Masuka) and Nyika Plateaus, recorded by Boulenger (1897e, p. 800) as "*Nucras tessellata*," were later made the cotypes of *Latastia johnstoni* (*vide infra*).

Native name of the Ornate Scrub-Lizard. *Kapanga* (Nyungwe), but "*soromónda*" is said by Peters (1854, p. 616) to be the name in use at Tete when he referred his specimen from there to *delalandii*, but subsequently (1882a, p. 44) changed it to *tessellata*.

Taxonomy. It is with a little reluctance I use trinomials for there is some uncertainty as to whether these southeastern lizards should be regarded as a race of *intertexta*. The South African members of the genus appear to be in a chaotic state and much in need of a comprehensive revisionary study.

My material is topotypic of both *ornata* and *cameranoi*, the striped juvenile agreeing perfectly with Gray's original description of the former, while all the adults unquestionably represent *cameranoi* which was based on a fine adult.

In his Monograph, Boulenger (1920e, p. 24) places *ornata* in the synonymy of *tessellata* (A. Smith, 1838) and (p. 20) *cameranoi* in the synonymy of what he calls *intertexta* var. *holubi* (Steindachner), a distinctively marked Transvaal lizard of much smaller size. I had already reached the conclusion that *ornata* should be revived and *cameranoi* be made a synonym of it, when I turned up Cott's (1934a, p. 161) paper based on Mozambique material and found he had already clarified the situation somewhat, though overlooking the role of *ornata*. Cott's admirable descriptions of the strikingly different color patterns of adult and juvenile make it unnecessary for me to mention them again.

Variation. Granules between supraoculars and supraciliaries 2–4; supraciliaries 5–7; gulars between chin-shields and median gular plate 26–31; greatly enlarged collar plates 10–12; greatly enlarged plates beneath forearm 6–8; dorsals transversely 41–46; ventrals longitudinally 30–34; femoral pores 14–18; lamellae beneath fourth toe 24–30.

Size. Largest ♂ (M.C.Z. 50999), 319 (88 + 231) mm.; larger ♀ (M.C.Z. 51000), 241+ (82 + 159+) mm. as tail regenerating; juvenile (M.C.Z. 50986), 86 (32 + 54) mm.

Breeding. Ova small in January.

Diet. Beetles, black cricket, grasshopper, spider.

Enemies. The juvenile hatchling was removed from the stomach of an Eastern Beaked Snake (*Rhamphiophis o. rostratus*).

Habitat. This large lizard is an inhabitant of arid savanna scrub at low altitudes. The Ndirandi specimen was taken on the lower slopes where from time to time others were seen dashing across the road in

search of shelter among the numerous clumps of grass rising from the eroded ground. There, relying on its coloring, the lizard would remain immobile, permitting me to approach fairly near before darting away another fifty feet or so — until finally shot.

Latastia johnstoni Boulenger

Nucras tesselata Boulenger (not of Smith), 1897e, p. 800.
Latastia johnstoni Boulenger, 1907d, Ann. Mag. Nat. Hist. (7), **19**, p. 392: Misuku (as Masuka) and Nyika Plateaus, Nyasaland.
Latastia bredoi de Witte, 1942, Bull. Mus. roy. Hist. nat. Belgique, **18**, No. 41, p. 1, figs. 1–2: Musosa, Tanganyika District, Belgian Congo.
Boulenger, 1921a, pp. 16, 409; Pitman, 1934, p. 305.

♀ (M.C.Z. 51003) Bua River. 25.xi.48.

Records. Misuku Mountains (B); Nyika Plateau (B). Since the two lizards on which these records are based were collected by Whyte and presented to the British Museum by Sir Harry Johnston in 1897, no further specimens have been recorded from Nyasaland where it is not uncommon in arid upland scrub. I cannot refrain from questioning the altitude (6000–7000 feet) from which the types allegedly came. Though on the lookout, I saw no sign of *johnstoni* either in the Misukus or on the Nyika and the many examples I collected in Tanganyika were taken between 1000 and 4000 feet. Bua River is about 3200 feet. One wonders whether the cotypes were not taken by Whyte in the uplands he passed through on his way from the Nyika to the Misukus.

Pitman (1934, p. 305) merely lists the Nyika record and suggests the species may occur in Northern Rhodesia. It does, for we recently received from Dr. H. J. Bredo, what are presumably the first recorded examples (M.C.Z. 47136–7), taken between Kabuta and Mweru Wantipa.

Synonymy. In describing *Latastia bredoi*, Witte differentiates it from *johnstoni* on the grounds that it has only 6 instead of 8 ventrals transversely. It is true that Boulenger (1921a, p. 17) says the ventrals are in 8 longitudinal series, but he adds "the outermost very narrow." In our extensive Tanganyika series the outer rows on either side vary considerably in size but are mostly so insignificant that few herpetologists would consider them as ventrals. This is a condition common to many lacertids and I suggest it would be less ambiguous to describe them as 6 + 2; such a formula would help to standardize the situation and eliminate the possibility of the "2" being counted with the dorsals

transversely. I would also suggest that the phrase "dorsals *transversely*" is less likely to confuse students than the time-honored one of "dorsals in *longitudinal* series" which means precisely the same thing.

The second difference cited as distinguishing *bredoi* is that though the type had only 26 lamellae beneath the fourth toe (21–26, extremes checked, in our series of *johnstoni*, 22–25 in Boulenger's Monograph) the paratype (presumably) had 25 and 28 lamellae respectively as this is the range given for *bredoi* of which only a pair (♂ ♀) are known. To recognize a race because of a slightly higher count on a single toe of the four available scarcely seems advisable. Much depends on the precise point where one stops counting the lamellae which occasionally extend to the sole Personally I favor stopping on a level corresponding to the fork between third and fourth toe; if the count is carried on to the fork between the fourth and fifth toe several additional lamellae will be included.

Variation. Granules between supraoculars and supraciliaries 10; ventrals longitudinally 26. Most other counts are within the range of those given for *Nucras i. ornata*, a species with which *johnstoni* was formerly confused.

Size. ♀, 212 (63 + 149) mm.

Breeding. On November 25 this ♀ held 4 ova measuring about 6 x 5 mm.

Diet. A large spider in stomach.

Habitat. Shot on roadside just south of Bua River "bridge." Lizards believed to be this species were not infrequently seen on the roads but fled into the underbrush when cars approached.

Ichnotropis capensis (Smith)

Algyra capensis A. Smith, 1838, Mag. Nat. Hist., **2**, p. 94: "Sandy deserts around Latakoo," i.e. Kuruman, Bechuanaland Protectorate.

Tropidosaura dumerelii (*sic*) A. Smith, 1849, Ill. Zool. S. Africa, Rept., App. p. 7: "Sandy deserts to the north-east of Latakoo."

Ichnotropis macrolepidota Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 617: Delagoa Bay, Mozambique.

Ichnotropis longipes Boulenger, 1902, Proc. Zool. Soc. London, **2**, p. 17, pl. iii, fig. 2: Mazoe, Southern Rhodesia.

Ichnotropis overlaeti Witte & Laurent, 1942c, Revue Zool. Bot. Afr., **36**, p. 173: Kapanga, Lulua, Belgian Congo.

♂ (M.C.Z. 51007) Kasungu. 25.xi.48.

Records. New to Nyasaland.

Variation. Frontonasal single; midbody scales and ventrals 36; femoral pores 10 + 11; the adpressed hind limb reaches the ear; hind foot 1.15 times as long as head.

Synonymy. Faced with the decision as to which race this lizard should be referred, I consulted FitzSimons (1943, p. 349) whose key reads as follows: —

> Foot only slightly longer than head; adpressed hindlimb in males reaches to between shoulder and ear (exceptionally as far as ear) . . *c. capensis*
> Foot from 1¼ to 1½ times length of head; adpressed hindlimb in males reaches to ear or between ear and eye . . . . . *c. longipes*

From this it is clear the Nyasaland lizard is a typical *capensis* which does not make much sense of a northeastern or eastern race. If recognizable, however, Hewitt (1925b, p. 360) long ago pointed out that *macrolepidota* should take precedence over *longipes*. It was to *longipes* that Witte (1933m, p. 74) referred 51 lizards from Dilolo, Belgian Congo, when he furnished detailed measurements of six males whose head lengths ranged from 9–10 mm., their hind feet from 17–19 mm. so that the length of head is included in that of the foot from 1.80 to 2.11 times. Witte's head measurement was not taken from end of snout to back of ear-opening apparently, for measurements of five males (M.C.Z. 42873–8, etc.) from the same Dilolo series show head lengths of 15–16 mm., hind feet of 18–19 mm., and consequent inclusion of head into foot lengths of 1.18 to 1.26 times, their adpressed hind limbs extend to between shoulder and ear (2 ex.) or to ear (3 ex.).

Examination and scale counts of all our material suggests that the head/foot ratio of males provides no basis for separation of a zoogeographical race, the conclusion being that the adpressed hind limb of males normally reaches the ear but may sometimes fall short or extend beyond. I am assured by Mr. C. J. Battersby that it extends beyond in all three cotypes of *longipes* whose head to ear measurements are 12.5, 12 and 12 mm., the corresponding hind foot to heel measurements being 15, 15 and 16 mm. A summary of the material in the Museum of Comparative Zoology furnishes the following results: —

Adpressed hind limb reaches to between *shoulder and ear*, or to *ear*.

5 males from Dilolo, Belgian Congo		2	3
1	" Waterberg Plateau, S.W. Africa	1	0
1	" Chishawasha, S. Rhodesia	0	1
3	" Waterberg District, Transvaal	3	0

3 males Lourenço Marques, Mozambique	1	2
1 " Kasungu, Nyasaland Protectorate	0	1

An additional character employed for the separation of *longipes* in Boulenger's (1921a, p. 180) monograph, but omitted for good reason by FitzSimons (1943, p. 349) in his key, is the length of the anterior supraocular, said by Boulenger to be "as long as or a little shorter than its distance from the second loreal" in *capensis*, but which FitzSimons finds (p. 353) "as long as or a little longer than its distance from (the) posterior loreal." A definition with which our twenty-two specimens conform. Apparently it was Boulenger's statement that led Witte and Laurent to separate *overlaeti* from *capensis* on the grounds that the anterior supraocular was "plus longue que la distance qui la sépare de la frénale postérieure."

Ichnotropis squamulosa Peters

Ichnotropis squamulosa Peters, 1854, Ber. Akad. Wiss. Berlin, p. 617: Tete, Mozambique. Boulenger, 1887a, p. 79; 1897e, p. 800; Johnston, 1898, p. 361; Boulenger, 1921a, pp. 191, 425.

♂ ♀ (M.C.Z. 51004–5) near Tete. 14–18.i.49.

Records. Fort Hill (B); Lake Nyasa (B). There is also a specimen from Cholo in the British Museum (A.L.).

Native name of Rough-scaled Sand Lizard. *Karangawoni* (Nyungwe).

Variation. Frontonasal paired; midbody scales and ventrals 44–50; femoral pores 13–17; the adpressed hind limb reaches the ear or just beyond; hind foot 1.21 to 1.33 times as long as head.

Color in life. ♂. Above, head muddy brown, side of head lighter, labials white; mid-line of back muddy brown flanked by a series of light spots beyond which is a series of squarish black marks alternating with rusty-red ones, outside this again a white dorsolateral line starts from the elongate temporal; flanks with a corresponding series of squarish black marks alternating with rusty-red ones below which is a white line that commences at the ear-opening and continues to the insertion of the hind limb; below it again a further series of alternating black and rusty-red marks; limbs rusty brown flecked with black and white; tail buff with indistinct fleckings. Below, uniformly white.

Breeding. Ova small in January.

Diet. A caterpillar in one; many termites in the other.

Habitat. Running about eroded ground on the outskirts of Kasumba-

dedza Village, where ♀ was shot after sunset as a blood-red new moon was rising over the thornbush.

Holaspis guentheri laevis Werner

Holaspis Guentheri laevis Werner, 1895, Verh. Zool. Bot. Ges. Wien, **45**, p. 191, pl. v, fig. 4· Usambara Mountains, Tanganyika Territory.
Holaspis guentheri Boulenger (part), 1921a, pp. 378, 379, 380, 440.

♀ (M.C.Z. 51006) Ruo River Market. 3.viii.48.

Records. Zomba (B). Our specimen from the foot of Mlanje Mountain is the second to be recorded from Nyasaland.

Variation. Dorsals transversely 71; ventrals transversely 6; femoral pores 21 + 23.

Color pattern. I revive Werner's race because I find all our East African material is separable from typical *guentheri* as follows: —

A dorsolateral and two lateral dark longitudinal lines; range: Tropical West Africa from Sierra Leone south to Angola east to Uganda .... *g. guentheri*

A dorsolateral and one lateral dark longitudinal line; range: Tropical East. Africa from northeast Tanganyika Territory south to Amatongas, Mozambique ..... *g. laevis*

Size. ♀, 106 (47 + 59) mm.

Breeding. On August 3 this female held two eggs measuring 9 x 6 mm.

Habitat. Basking about ten feet up on one of the tree trunks in the row separating the market from the main road.

AMPHISBAENIDAE

Monopeltis sphenorhynchus Peters

Monopeltis sphenorhynchus Peters, 1879b, Monatsb. Akad. Wiss. Berlin, p. 275: Inhambane, Mozambique (now restricted). Boulenger, 1885e, p. 455; 1891a p. 306; Loveridge, 1941a, p. 427, fig. 47 (revision).

Records. Shire Valley (B); "Zambesi," i.e. Zambesi Expedition (B). In addition Mr. Mitchell informs me that he once took what he believes was a species of *Monopeltis* at Chitala River. But for this one might argue that the earlier records referred to that part of the Shire Valley which is in Portuguese territory.

Remarks. As the Wedge-snouted Worm-Lizard is the only member of its genus having two lower labials it would be of considerable interest to have more material to see if this character is constant.

Habitat. Worm-lizards burrow in sandy or laterite soils, rarely appearing on the surface except after heavy rain or when attacked by driver ants. Had the rains materialized during my visit to Nyasaland I felt confident that I would have secured not only *Monopeltis* but probably undescribed species of the genus *Amphisbaena* which occurs in the surrounding territories.

CORDYLIDAE

Cordylus cordylus tropidosternum (Cope)

Zonurus tropidosternum Cope, 1869, Proc. Amer. Philos. Soc., **11**, p. 169: "Madagascar" (presumed error for Mozambique).
Zonurus cordylus Boulenger (not Linné), 1897e, p. 800; Johnston, 1898, p. 361
Cordylus cordylus tropidosternum Loveridge, 1944p, p. 35 (revision).

Records. Fort Hill (B); Misuku Mountains (B); "Nyika Plateau" (B). Due to an oversight these specific localities were omitted from those cited on page 36 of my revision of the family.

Enemies. Though I failed to collect the Eastern Girdle-tail in Nyasaland, I recovered the tail of one from the stomach of a Vine-Snake (*Thelotornis k. capensis*) killed at Chowe, near Fort Johnston. The tail of a *Cordylus* with its great whorls of spines is not to be mistaken for that of any other genus, not excluding *Gerrhosaurus.*

Platysaurus mitchelli sp. nov.

Type. M.C.Z. No. 50657, an adult male, though testes small, from Ruo River Forest, Mlanje Mountain, Nyasaland. Collected by Arthur Loveridge, March 31, 1949.

Paratypes. M.C.Z. Nos. 50658–75, being 18 specimens representing both sexes with the same data as the type.

Diagnosis. This, the most northerly *Platysaurus* known, appears to be ancestral to the nine other members of the genus from all of which it differs by possessing a pair of supranasals[1] and 12 (instead of 16 to 26) quadrangular ventrals in longitudinal series across the belly. Femoral pores are equally developed in both sexes. *P. mitchelli* combines certain differential characters utilized in the first major division of my key to the genus (1944p. p. 83), agreeing with the first portion of section 1 only in having the anterior aspect of the limbs covered with strongly keeled scales, but in the four remaining characters it

[1] For in *capensis* the nostril is usually considered as being between the upper and lower portions of a divided nasal.

conforms to the second portion of the section and would appear to be more closely related to the Transvaal races of *guttatus* occurring at Barberton (*wilhelmi*), on the Waterberg (*minor*) and on the Drakensberg (*orientalis*), rather than to the large forms residing in arid lowlands.

Description. Type ♂. (Paratype variations in parentheses, for which purpose both sides of every specimen have been examined unless otherwise stated). Rostral twice as broad as high, separated from the frontonasal by a pair of supranasals; frontonasal much shorter than broad, separated (in contact in M.C.Z. 50668 only) by a pair of prefrontals from the frontal; frontal broader anteriorly; a pair of postfrontals; two pairs of parietals; interparietal large, diamond-shaped, posteriorly in contact (*separated* in all but two of the paratypes) with a *very* small, wedge-shaped and divided occipital; a nasal; a postnasal; a loreal; a preocular; supraoculars 4; supraciliaries 4; 4 upper labials anterior to the suboculars; suboculars 4, second and third reaching the lip, the last much reduced; lower labials 5 (4–6); sublabial shields 6 (5–6), the last much reduced; enlarged temporals in two longitudinal rows, the uppermost much the larger (the centre of the lower row is replaced by granules in M.C.Z. 50669 only).

Side of neck covered with more or less uniform small granules; collar scales 11 (9–13), many only slightly enlarged; granules on flanks subuniform; ventrals forming 12 (flanked by an undeveloped outer row) regular longitudinal and 40 (36–40) transverse rows, those nearest the collar and preanal region almost granular; limbs covered anteriorly with keeled scales; the adpressed hind limb reaches the neck; femoral pores 20 (18–21) counted on left thigh only (present in both sexes).

Color in life. Type ♂. (Which, as the largest, was selected in the field and the following description recorded). Above, black; rostral, upper labials and lower temporals faintly greenish; from frontonasal to base of tail a yellow vertebral line that anteriorly is more or less broken up into a series of dashes, posteriorly into a series of juxtaposed spots; on either side is a yellow dorsolateral line starting from the lower edge of the supraoculars and supraciliaries where, as also in the temporal region, it is interrupted, then continues as a complete line to base of tail; limbs and flanks indistinctly spotted with cream; digits crossbarred with white; tail brownish black, dorsolaterally faintly streaked with creamy white. Below, mental salmon pink, lower labials and sublabials pale blue; gular region anteriorly tinged with pink but posteriorly a rich blue; chest, belly and limbs greenish white; tail buff

or slightly pinkish white.

Size. Total length of ♂ holotype, 136 (46 + 90) mm., though in the field it measured 140 (48 + 92) mm.; paratype ♀ (M.C.Z. 50673), 123 (42 + 81) mm.; the head and body length of the remaining seventeen paratypes ranged from 39 to 52 (average 43.6) mm.

Sexual dimorphism. I thought there was a color difference in life but neglected to note it down and now the sexes are separable only by dissection; it is clear that they were not breeding.

Diet. Ants, a grasshopper, and a spider, in the type.

Habitat and *Remarks.* To me this species appears the least specialized member of the genus for it does not require fissured rocks but lives on boulders flanking the small mountain torrent tributaries of the Ruo River where they pass through the Ruo Forest. In places the sides of such torrents have been protected from erosion by sloping brick walls or cement work, much overgrown by moss. On these the lizards basked like so many *Lacerta muralis* and when pursued were at a loss to find a fissure in which to hide. Others were seen sunning on the short rough planks forming the bridges that spanned the gullies. In this situation the lizards were next to impossible to catch for the first footstep of an approaching person on the bridge was sufficient to make them slip over the side and underneath. Of all the situations in which I found them, the strangest was the sloping, more or less mossgrown, cement basework of the pumping power station in a clearing of the forest, and there they were as numerous as anywhere.

The first half-dozen seen on bridges or boulders, I shot, but the rest of the series we caught by hand, heading them off with the help of my gunbearer until, bewildered, the small reptiles sought refuge in some shallow hole or beneath my boots. Where numerous, they probably fight a good deal among themselves for 7 out of 12 had regenerating tails when captured; the first 5 shed theirs when shot. Associated with them at the pumping station were a few skinks (*Mabuya q. obsti*) which they closely resemble in longitudinal striping, indeed the Nyanja natives failed to distinguish them, calling both species *nabulusi*, a name more properly belonging to the well-known skink.

Though I visited their haunts on half-a-dozen days, apparently temperature and weather conditions were never exactly right for *mitchelli* except on March 31 when the sun broke through and shone warmly for an hour or two about noon. On no other occasion did I get more than a fleeting glance of an occasional lizard.

To me *mitchelli* appears to be the least specialized member of the genus, and suggests the speculation that in the days when Africa was more heavily forested, *Platysaurus*, which is no more flattened than the lacertid *Holaspis*, was also an arboreal form that sought shelter beneath slivers of bark.

Soon after our return from the Likabula River, Mlanje Mountain, Mr. B. L. Mitchell asked me if I had collected any *Platysaurus*, a genus with which he was familiar in Southern Rhodesia and that he had seen on boulders bordering the Likabula just above the Forestry Depot. I had not, but during our afternoon visit to the Ruo River I had seen, but failed to get, a small lizard that I assumed was a skink. Mr. Mitchell's mention of *Platysaurus* proved a principal factor in my decision to return to the Ruo Forest for a longer stay. I take pleasure, therefore, in naming this very distinctive species after the first person to have recognized the presence of *Platysaurus* in Nyasaland, almost 150 miles northwest of its known range.

Platysaurus guttatus nyasae subsp. nov.

Type. M.C.Z. No. 50655, an adult female from rocks on *right* side of the Blantyre to Tete road a mile or so *south* of Mpatamanga Bridge, Nyasaland. Collected by Arthur Loveridge, January 31, 1949.

Paratype. M.C.Z. No. 50656, an adult female with the same data as the type.

Diagnosis. Most nearly related to *P. g. rhodesianus* FitzSimons, from which it differs in having subuniform granules on the side of the neck (instead of a patch of greatly enlarged ones as in female *rhodesianus*); in having 5–6 (instead of 4–5) upper labials anterior to the suboculars; 37 (instead of 40–48) ventrals in a line from collar to groin-row; and a relatively shorter tail, viz. 116 mm. for the type with a snout to anal length of 91 mm. (as against 149 mm. for a 92 mm. *rhodesianus*); the longitudinal dorsal stripes are narrower and the characteristic spotting on the flanks is lacking.

Description. Type ♀ (Paratype variations in parentheses). Rostral twice as broad as high, separated from the frontonasal by an internasal (or by the nasals); frontonasal as long as broad; frontal broader anteriorly; a pair of postfrontals; interparietal small, diamond-shaped, enclosed between two pairs of parietals and widely separated from a small, wedge-shaped occipital (which is posterior to the parietal suture in the paratype); a nasal; a postnasal; a loreal; a preocular; supra-

oculars 4; supraciliaries 4; 5–6 upper labials anterior to the suboculars; suboculars 4, the second and third reaching the lip; lower labials 5–6; sublabial shields 5 (4-6); enlarged temporals in 2 longitudinal rows.

Side of neck covered with more or less uniform small granules; granules on flanks enlarged; collar scales 11 (12); ventrals forming 18 regular longitudinal and 37 transverse rows; limbs covered anteriorly with granules and rugose, strongly keeled scales; the adpressed hind limb reaches the axilla; no femoral pores.

Color in formalin. Above, head, back, flanks and limbs blackish, unspotted, but with three, light, sharply defined, narrow, longitudinal lines extending from snout or supraoculars to base of tail; tail pale buff, medially with a broad, but rapidly tapering, black line that breaks up into a series of dusky blotches on the proximal portion of each verticil around which they spread to produce an annulate effect on the distal third of the tail. Below, white, with dusky flecks scattered sparsely on chin and gular region, more abundantly on chest, along the sides of the belly, and on the hind limbs; neck just in front of collar exhibits three dusky streaks; tail almost immaculate.

It is unfortunate that the beautiful coloration of the living lizard was not recorded, an omission resulting from the exigencies of motorized travel.

Size. Total length of ♀ holotype (M.C.Z. 50655), 207 (91 + 116) mm., that of the ♀ paratype (M.C.Z. 50656), 194 (90 + 104+) mm., the tip of its tail being missing.

Parasites. Nematode worms (*Pharyngodon* sp. 2 ♀ ♀, and *Thubunaea* sp. 2 imm.) were recovered from the stomachs of the types, and identified for me by Mr. J. T. Lucker.

Habitat. The massive rocks where I shot these *Platysaurus*, the first members of the genus to be taken north of the Zambezi, also harbored *Agama k. kirkii, Gerrhosaurus v. validus, Mabuya q. margaritifer,* and *M. lacertiformis,* the last mentioned also new to Nyasaland.

Platysaurus guttatus torquatus Peters

Platysaurus torquatus Peters, 1879a, Sitzb. Ges. Naturf. Freunde Berlin, p. 10: Tete, Zambezi River, Mozambique.

5 ♂♂, 3 ♀♀ (M.C.Z. 50647–54) near Tete. 20–28.i.49.

Native name. Sankwata (Nyungwe). Peters gave *bunio* as the name applied to this species at Tete, but this is a variant of *mbuniu,* the

Nyungwe name for *Mabuya q. margaritifer*.

Variation. This topotypic series agrees with the key characters of my (1944p, p. 83) revision, except that the occipital wedged between the posterior parietals cannot be termed "large" as it is frequently broken up and subject to fusion with the interparietal. The following constitute extensions to the variation listed for this race in the statistical table on p. 85. Rostral 2–2½ times as broad as high; collar scales 6–8; ventrals in 16–19 longitudinal, and 35–39 transverse rows.

Size. None surpass the cotypes' measurements.

Color. That of the chin and throat described on page 84 is of a subadult male, for the throats of adult males are substantially black. In alcohol the sexes may be distinguished by the pink color of the male tail as compared with the dark tails of the females.

Habitat. This is apparently restricted to a particular type of rock that is subject to sun-splitting in a way that gives rise to very narrow fissuring. Shortly after my arrival at Kasumbadedza I began enquiring of the villagers as to where *Platysaurus* might be found. Several averred they were acquainted with *Platysaurus* but I fancy most of them were confusing it with the rock-dwelling *Mabuya q. margaritifer* whose male and female bear an astonishing resemblance to the corresponding sexes of *Platysaurus g. torquatus*.

Being especially anxious to secure topotypic material I kept a constant lookout for the lizard yet nearly three weeks elapsed before we found the first. Then one evening I was collecting among the rocks called Mwanza close to the bank of the Zambezi when my gunbearer halted abruptly and, moving only his eyes to indicate a rock at his elbow, said slowly: "Sir, anuzzer kind." From where I was, about twenty feet away, I replied: "It's only a halfgrown (*margaritifer*)," but shot it nevertheless, and was delighted to discover that it was indeed the long-sought *torquatus*. After that it was relatively easy to shoot another half-dozen for the members of this particular colony appeared less wary and alert than the *margaritifer* occurring on the same rocks. Previously I had passed within a hundred feet of these rocks without seeing a *Platysaurus* for they occupied a very restricted area.

VARANIDAE

Varanus niloticus niloticus (Linné)

Lacerta nilotica Linné, 1766, Syst. Nat. ed. 12, **1**, p. 369: Egypt.
Monitor niloticus Günther, 1864b, p. 307.

Varanus niloticus Boulenger (part), 1885e, p. 317; 1897e, p. 800; Johnston, 1898, p. 361; Mitchell, 1946, pp. 28, 41.

♀ (M.C.Z. 51008) Chitala River. 17.xii.48.
2 ♂♂, 3 ♀♀, 4 juv. (M.C.Z. 51009–17) Mtimbuka. 7–24.ii.49.
♀ (M.C.Z. 51018) Kausi Village. 25.ii.49.
♀ (M.C.Z. 51019) near Tete. 20.i.49.

Records. Karonga to Kondowe (B); Nkata Bay to Ruarwe (B). Mr. Mitchell informs me that he has seen this species at Chikwawa; Chiromo; Fort Johnston; Monkey Bay; Port Herald; and Zomba.

Native names of Common Water-Monitor. *Mwanzi* (Nyungwe); *sakata* (Yao). See also Mitchell *loc. cit. supra.*

Variation. An examination of all the *niloticus* material in the Museum of Comparative Zoology necessitates a slight modification of the key in Mertens' (1942c, p. 320) monumental revision of the Varanidae, viz:

3–5 transverse rows of yellow spots or crossbars between fore and hind limbs ..... *n. ornatus*
6–9, rarely 5, rows of yellow spots or crossbars between fore and hind limbs ..... *n. niloticus*

Size. Larger ♂ (M.C.Z. 51009), 835 (305 + 530) mm.; largest ♀ (M.C.Z. 51016), 906 (326 + 580) mm.

Breeding. In mid-February young monitors ranging from 321 (126 + 195) to 346 (138 + 208) mm. were plentiful enough near the lakeshore though it is commonly remarked that young monitors are hard to find.

Diet. Stomach contents of the Mtimbuka lizards were: — (1) three crushed *Cycloderma frenatum* eggs, shells and all, also a large mole cricket; (2) a lizard or snake's egg, grasshopper, caterpillar; (3) a sizeable bullfrog (*Rana a. edulis*); (4) four small fish which may or may not have been found dead; (5) a large cricket; (6) a very large caterpillar; (7) about two dozen pupae of the greenbottle fly whose larvae had been feeding on the carcass of a baboon.

Parasites. Ticks (*Aponomma* sp.) were preserved from the Kasumbadedza monitor, and nematodes (*Tanqua tiara*)from several Mtimbuka specimens, also an *Amplicaecum* sp. from a monitor taken at Mikindani, Tanganyika Territory in April, 1939.

Enemies. A juvenile was recovered from the stomach of a Stripe-bellied Sand-Snake (*Psammophis s. subtaeniatus*) killed at Kasumbadedza.

Habits. The adult Chitala monitor was resting on grass and debris floating in about five feet of water in an abandoned well up whose twenty-foot sides the lizard could not climb. An exceptionally large adult was seen sunning on the summit of the frondless trunk of a drowned coconut palm towering thirty feet above the waters of the lake; as our boat approached the reptile, it crawled in leisurely fashion into the palm's hollow interior. Within a few yards of the lakeshore, at a height of twelve feet from the ground, a halfgrown monitor was clinging to a mat of creepers smothering a bush or small tree. Apparently sunning, it ignored our presence so that I was able to kill it with dust shot fired from the .22 through its crown. A possible explanation of its lethargy was its gorged condition as listed above under (1). At 5.30 P.M. one dull afternoon just before sunset I observed a young monitor (M.C.Z. 51013) ten feet from the ground on a twig of a bare and leafless thorn tree where the lizard presumably intended to pass the night. At 8.40 P.M. the same evening my flashlight revealed another lying along a spray overhanging a deep pool; on either side of the twig the lizard's legs hung limply down, the claws of each pair touching or almost touching each other.

On Bwadzulu Island in Lake Nyasa these monitors are especially abundant. On his return from a visit to the island in Easter, 1947, Mr. B. L. Mitchell wrote (10.iv.47) that he had never before encountered so many of the reptiles; at times three or four would be disturbed at once though he thought the average would be nearer one per hundred yards walked.

Varanus exanthematicus microstictus Boettger

Monitor microstictus Rüppell, 1845, Mus. Senckenberg., **3**, p. 301: (*Nomen nudum*).

Varanus microstictus Boettger, 1893a, Kat. Rept. Samml. Mus. Senckenberg. Naturf. Ges., Part 1, pp. viii, 72: Ethiopia.

Varanus ocellatus Johnston (not of Heyden), 1897 and 1898, p. 361.

Varanus (*Empagusia*) *exanthematicus microstictus* Mertens, 1942c, p. 355: (revision).

Records. The Eastern Savanna-Monitor is the dry country species that for a whole century has been miscalled the Eyed Monitor, *V. ocellatus* (Heyden in Rüppell), a name that Mertens (1942c, p. 352) found was actually synonymous with typical *V. e. exanthematicus* (Bosc) of Senegal. Whether it actually occurs in the Protectorate is

not known (the matter is discussed below) but true *microstictus* occurs in extreme southeast Tanganyika Territory for we have half-a-dozen examples from Mikindani. The precise meeting place of the two forms remains to be worked out. To the Yao at least it would be known as *ligondo*, if present.

Varanus exanthematicus albigularis (Daudin)

Tupinambis albigularis Daudin, 1802, Hist. nat. Rept., **3**, p. 72: pl. xxxii: Type locality unknown.

Varanus albigularis Boulenger, 1885e, p. 307; 1891a, p. 306; Johnston, 1897 and 1898, p. 361.

Varanus (*Empagusia*) *exanthematicus albigularis* Mertens, 1942c, p. 357: (revision).

Neranus (*sic*) *albigularis albigularis* Mitchell, 1946, pp. 28, 41.

2 ♂♂, 3 ♀♀ (M.C.Z. 51020–4) near Tete. 12–20.i.49.

Records. The inclusion of this race in the Nyasaland fauna rests chiefly on the young individual (B.M. 77.7.2.1) from Lake Nyasa recorded by Boulenger. This specimen has been re-examined by Messrs Parker and Battersby who consider it conforms with *albigularis*, rather than with *microstictus*, in possessing nuchal scales that (without their surrounding disks) are no larger than those on occiput and back. In the number of its midbody scale-rows (135) and ventrals (90 between collar and hind limbs) it might belong to either form. Nyasaland is in an area of intermediates and we shall not know what is the correct name to apply to monitors from the Protectorate until some resident is willing to take the trouble to collect and preserve a representative series carefully labeled as to precise locality.

According to the Yao I questioned, the *ligondo* occurs on the eroded rocky hills to the north and east of Mtimbuka. I failed to find any there during the brief time at my disposal, but I believe that Mr. B. L. Mitchell has captured live ones in the vicinity as well as in other parts of the Protectorate.

Native name of White-throated Savanna-Monitor. *Ligondo* (Yao); *Gondwa* (Nyungwe); see also Mitchell (1946, p. 41).

Variation. Midbody scale-rows 135–148; ventrals longitudinally from collar fold to level of hind limbs 88–98. These scale-counts (extremes checked) conform to the range of *albigularis* as defined by Mertens (1942c, p. 351).

However, in the major key character as to the relative size of nuchal

and dorsal scales in the various races of *exanthematicus*, there is so much variability in the series, more especially between the oldest and youngest females, that I find it difficult to decide whether the nuchal scales, without their surrounding disks, are "as large as" or "distinctly larger than" those on the occipital region and dorsum. In this character I am inclined to think the series as a whole agrees more nearly with the definition of *microstictus* rather than with *albigularis*. In view of the locality being on the borderline between the ranges of the two forms, this is not surprising.

Size. Larger ♂ (M.C.Z. 51020), 705 (305 + 400) mm.; largest ♀ (M.C.Z. 51022), 880 (400 + 480) mm.; smallest ♀ (M.C.Z. 51024) 511 (236 + 275) mm.

Diet. In one male a scorpion, two *Brachystegia* crickets, numerous hard-shelled beetles, and a millipede; a female held many cockroaches, a half-grown *Brachystegia* cricket, and the remains of several millipedes.

Parasites. Both ticks (*Aponomma* sp.) and nematodes (*Abbreviata paradoxa; Polydelphis* (*Hexametra*) sp.; *Tanqua tiara*) were preserved.

TYPHLOPIDAE

Typhlops tettensis obtusus Peters

Typhlops (*Onychocephalus*) *obtusus* Peters, 1865a, Monatsb. Akad. Wiss. Berlin, p. 260, pl., fig. 2: Shire River, Nyasaland (emended). Peters, 1882a, p. 95; Boulenger, 1891a p. 396; 1893b, p. 38; Günther, 1893 (1892), p. 555; Bocage, 1896a, p. 90; Boulenger, 1896d. p. 586; Johnston, 1897, p. 362; 1898, p. 361a; Boulenger, 1915c, p. 615; Werner, 1921b, p. 313.

Typhlops decorosus Sternfeld (possibly not of Buchholz & Peters), 1908c, p. 242.

Typhlops tettensis obtusus Loveridge, 1942e, p. 257 (key, but unreliable).

2 ♀ ♀ (M.C.Z. 51025–6) Cholo Mtn. 18 & 24.iii.49.
3 ♂ ♂, 2 ♀ ♀ (M.C.Z. 51027–31) Mlanje Mtn. 1–4.iv.49.

Records. Blantyre (coll. Mitchell: in Brit. Mus.) Mlanje Mtn. (S); Shire Highlands (G); Shire River (P); Shire Valley (B); Zomba (coll. Johnston: in Brit. Mus.). Sternfeld's record of *decorosus* appears in a paper entitled "Schlangen aus Britisch-Ostafrika" dealing with the snakes of Uganda and Kenya where he apparently thought "Milanji, Brown" was situated. The late M.A. Brown, a well-known resident of Nyasaland, owned three cottages on Mlanje and the route he pioneered up to the plateau known as "Brown's road" lies fairly near where I collected the specimens listed above.

Native name of Shire Blind-Snake. *Ntonga* (Manganja and Nyanja).

Variation. Preocular in contact with second and third labials, (as is the case with a Blantyre and Zomba snake in the British Museum, but in a Shire Snake and both cotypes in contact with the second only), ocular with third and fourth (or third only in one type and two other snakes in Brit. Mus.); eye indistinguishable except in smallest specimen, though its probable position is usually indicated by a spot of pigment; midbody scale-rows 24 (22–23 in Brit. Mus. material); midbody diameters 3–6 (4–5–6 in Brit. Mus.); being included 47–74 (44–75.5 in Brit. Mus.) times in total length; tail length from 90–99 times in known ♂♂, 120–141 times in ♀♀.

Keys based on relative proportions of museum material are apt to be misleading when applied in the field to freshly killed examples of such attenuated, elastic-like snakes as these. The following comparative figures will serve to illustrate the point.

		Measured in field			*Measured in laboratory*		
Cat. Nos.	Sex	Head & Body	Tail	Tail into total L.	Head & Body	Tail	Tail into total L.
M.C.Z. 51031	♂	158.5	1.5	106	141.5	1.5	95
51030	♂	327	3	110	295	3	99
51028	♂	391	4	98	356	4	90
51027	♀	387	3	130	357	3	120
51025	♀	319	3	107	308	3	103

Boulenger's (1893b, p. 11) key separates *obtusus* from *decorosus* solely on the diameter/total length ratio, 43–50 for *obtusus*, 60 for *decorosus*. It will be seen that our almost topotypic series of *obtusus* nearly embraces the entire range for both species!

T. decorosus Buchholz & Peters, 1875, is a Cameroons species and Sternfeld's identification of a Mlanje snake with it serves to draw attention to their very close similarity. They may even prove to be specifically identical judging by our single, much-damaged, example of *decorosus* from Sakbayeme, French Cameroon.

Size. Largest ♂ (M.C.Z. 51028), 360 (356 + 4) mm.; largest ♀ (M.C.Z. 51027), 360 (357 + 3) mm.

Diet. The stomach of one was full of long, fat-bodied, flying ants, that of another with termite larvae; intestines of a third with termite remains.

Parasites. A nematode worm (*Kalicephalus* sp.) was recovered from a Mlanje snake.

Habitat. The smallest, a rather pallid pink in life, was found beneath a log on the hillside beyond the cattle boma near the Lujeri River; it was gorged with termite larvae from a nearby nest. We dug down about eight inches beneath where it had been lying and took the second largest male. All our Mlanje blind-snakes were collected between the Lujeri and Ruo Rivers which eventually flow into the Shire.

Typhlops schlegelii mucruso (Peters)

Onychocephalus mucruso Peters (part), 1854, Monatsb. Akad. Wiss. Berlin, p. 621: Maçanga, i.e. Makanga, Mozambique (restricted).

Typhlops mucruso Boulenger, 1896d, p. 588; 1897e, p. 800; Johnston, 1898, p. 361a; Bogert, 1940, p. 16.

1 (M.C.Z. 51032) Misuku Mtns. 2.x.48.
1 (M.C.Z. 51033) Mtimbuka. 11.ii.49.
2 (M.C.Z. 51034–5) Blantyre. xi.46 & 8.iii.49.

Records. Fort Johnston (Bogert); Nkata Bay to Ruarwe (B); Zomba (B). The Blantyre specimens were presented to me by Mr. B. L. Mitchell.

Native name of North Zambezi Blind-Snake. *Mbitu* (Yao); *mbuluzi* (Misuku, but also applied to *Melanoseps*).

Variation. Midbody scale-rows 34; diameter included in total length 35–40 times.

Color. The three smaller (200–325 mm.) specimens are gray above, punctate with black; below, white. The two-foot individual is a handsome chestnut-brown heavily blotched with black, these markings encroaching on the underside laterally but leaving the median line of the belly immaculate as in the younger specimens.

Size. Largest (M.C.Z. 51035), 620 (614 + 6) mm. Diameter 17.5 mm.

Typhlops schlegelii schlegelii Bianconi

Typhlops schlegelii Bianconi, 1850, Spec. Zoöl. Mosamb., p. 13, pl. iii, fig. 1: Inhambane, Mozambique.

Onychocephalus dinga Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 620: Chupanga; Sena; and Tete, Mozambique.

Onychocephalus mucruso Peters (part), 1854, Monatsb. Akad. Wiss. Berlin, p. 621: Tete, Mozambique.

2 (M.C.Z. 51036–7) near Tete. 21.i.49.

Range. But for the drought I had hoped, by collecting large series of this species, to be in a better position to define the ranges of the two forms found in the Zambezi region. Previously I (1933h, pp. 214–222) somewhat arbitrarily, in view of the difficulties, designated the Zambezi as serving the purpose of demarcating the two forms which are separable only on the basis of a higher average number of midbody scale-rows — 30–38 north of the Zambezi (*T. s. mucruso*), 32–44 south of the river (*T. s. schlegelii*). On the basis of the figures given below, my south Zambezi material might, with equal justification, be referred to the northern form. Indeed, it was from Tete that some of Peters' cotypes of *mucruso* came, his "species" being based on color pattern supported by native nomenclature and belief that two species were represented. The name *mucruso* is restricted to the Makanga cotypes, Makanga being just west of the Kirk Range on the Nyasaland frontier.

Native names of South Zambezi Blind-Snake. *Dinga* and *mucruso* (Nyungwe for the larger and smaller color phases).

Variation. Midbody scale-rows 34; diameter included in total length 30–45 times.

Color. The third-grown specimen is gray above, checkered with black; the larger one greenish black, each scale bearing a light fleck; in both the median line of the belly is immaculate.

Habits. As might be expected when daily temperatures were 100° or more, both these snakes emerged during or after a shower. One was brought in late at night and the other early the following morning.

LEPTOTYPHLOPIDAE

Leptotyphlops conjuncta distanti (Boulenger)

Glauconia distanti Boulenger, 1892a, Reptilia and Batrachia, in W. L. Distant, "A Naturalist in the Transvaal," p. 175, fig.: Pretoria, Transvaal. Boulenger, 1893b, p. 62; 1897c, p. 806; Johnston, 1898, p. 361a.

Records. Fort Hill (B).

Remarks. One would have supposed this specimen, which I have not examined, was referable to the common East African form, *L. c. conjuncta* (Jan). However, Mr. Battersby informs me that the rostral is more than half the width of the head and it consequently agrees with *distanti* in Boulenger's (1915c, p. 616) key. In the present chaotic condition of this group of snakes it appears advisable to let Boulenger's identification stand until such time as a general revision of the genus is undertaken.

Leptotyphlops longicauda (Peters)

Stenostoma longicaudum Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 621: Tete, Mozambique.
Glauconia emini Loveridge (not of Boulenger), 1923e, p. 874.

2 (M.C.Z. 51038–9) near Tete. 12.i.49.

Records. Kotakota (L). This is based on a British Museum specimen that in 1923 was labeled "*emini*", and whose label, since amended, I misread and listed (1923e, p. 874) as KosaKola. Last year through the courtesy of Dr. H. W. Parker I was able to re-examine the snake and note that, in addition to a largish supraocular, its diameter of 2 mm. is included in its length of 115 (103 + 12) mm., 57.5 times.

Native name of the Long-tailed Worm-Snake. *Nyakarukukutwe* (Nyungwe; furnished me by a knowledgable African named John Simbi, but *before* a specimen was secured).

Variation. Midbody scale-rows 14; diameter into total length 62–74.6 times; tail into total length 6.6–8.3 times.

Size. Presumed ♂, 186 (158 + 28) mm.; presumed ♀, 224 (200 + 24) mm.

Habits. Found crawling on the surface according to the captor, then presumably driven up by ants as the temperature was 90° at the time.

BOIDAE

Python sebae (Gmelin)

Coluber sebae Gmelin, 1788, Syst. Nat. (ed. 13), p. 1118: America (*errore*).
Python sebae Boulenger, 1897e, p. 800; Johnston, 1897, pp. 359, 362; 1898, pp. 359, 361a; Duff, 1906, p. 138; Mitchell, 1946, p. 42.

Head (A.M.N.H. 67786) Chibotela. 24.viii–8.ix.46.

♀ (M.C.Z. 51040) Chipoka, Lake Nyasa. 7.iii.49.

Records. Karonga to Kondowe (B); Lake Nyasa (D). Doubtless further localities are mentioned in other popular accounts of Nyasaland. Mr. B. L. Mitchell informs me that pythons occur at Chikwawa; Chiromo; Chitala; Fort Johnston; Lake Chilwa; Monkey Bay; Port Herald; and Zomba.

Native name of Rock Python. *Satu* (Yao). Mitchell records *nsato* as common to four Nyasa tribes.

Variation. Midbody scale-rows 93; ventrals 270; subcaudals 76;

labials 13–14, the first two deeply pitted, the third only slightly.

Size. ♀, 1732 (1510 + 222) mm. Johnston mentions measuring one 18 feet, 2 inches long.

Habitat. Shot by P. Joubert at Dally's Hotel on the lakeshore south of Mtimbuka. North of Mtimbuka I came on a slough, but never saw a live python during the eight months spent in the Nyasaland bush!

Folklore. An old woman visited my camp near Tete with a string of python vertebrae wound around her skinny neck. When I enquired whether she wore them as an ornament or for some other reason, she said that they strengthened the throat and to make her meaning clearer, emitted a couple of coughs. Later from beneath her only garment she produced a belt of vertebrae she was wearing about her waist "to strengthen the stomach," i.e. as an antidote to age's digestive difficulties. Her philosophy appeared to have a more rational basis than that indicated on a python-vertebrae necklet from Lagos, Nigeria, that I saw in the Pitt Rivers Museum in Oxford. Its label states: "worn as a charm against snakebite."

COLUBRIDAE

Natriciteres gen. nov.

1854. *Coronella* Peters (not of Laurenti, 1768, whose genotype was designated as *lacvis* by Boie, 1827), Monatsb. Akad. Wiss. Berlin, p. 622.

1861a. *Mizodon* (*sic*) Peters (not *Meizodon* of Fischer, 1856b, whose genotype is *regularis* = *M. coronata* [Schlegel]), Monatsb. Akad. Wiss. Berlin, p. 358.

1863. *Enicognathus* Jan (part; the genotype being here restricted to *occipitalis* Jan, 1863, currently referred to *Liophis*), Arch. Zool. Anat. Fisiol., **2**, p. 266.

1877c. *Neusterophis* Peters (not of Günther, 1863, whose genotype is *Natrix lacvissimus* Günther, a species referable to *Lycodonomorphus*), Monatsb. Akad. Wiss. Berlin, p. 614.

1884a. *Zacholus* Rochebrune (not of Wagler, 1830, whose genotype is *Coronella austriaca* Laurenti), Faune de la Senegambié. Reptiles, p. 156.

1886. *Grayia* Dollo (not of Günther, 1858, whose genotype was *Grayia silurophaga* Günther = *smythii* [Leach]), Bull. Mus. Hist. Nat. Belgique, **4**, p. 158.

1893b. *Tropidonotus* Boulenger (part; not of Kuhl, 1824, whose genotype is *tigrinus* Boie, 1826, currently referred to *Natrix*), Cat. Snakes Brit. Mus., **1**, p. 192.

1923. *Natrix* Schmidt (not of Laurenti, 1768, whose genotype is *vulgaris* Laurenti = *natrix* [Linné]), Bull. Am. Mus. Nat. Hist., **49**, p. 58.

Remarks. As will be seen from the foregoing synonymy, the group of five snakes comprising this genus has been assigned variously to seven different genera during the past century. More recently Bogert (1940, pp. 33–36) pointed out that these snakes consistently differed from the keeled-scaled African *Natrix* in a number of characters (italicised in the following description). He therefore revived the name *Neusterophis* for this homogeneous group, but *Neusterophis*, as shown later in this paper, is a straight synonym of *Lycodonomorphus*. No other name being available, I propose *Natriciteres* (♀ *Natrix* + *teres* = smooth, which has been suggested by Mr. Russell Olsen).

Genotype. Coronella olivacea Peters, 1854.

Description. Maxillary teeth 23–25, the anterior ones subequal, the last 3 or 4 sharply increasing in size; mandibular teeth slightly increasing in size towards middle of the jaw, decreasing posteriorly. Head slightly distinct from neck; eye moderate, with round pupil; nasal divided; a loreal; preoculars 1–2. Body cylindrical; scales *smooth, without apical pits,* in 15–19 rows; ventrals rounded. Tail moderate, tapering when intact; anal divided or entire; subcaudals in two rows. Hemipenis of male *basally bifid, exhibiting a short secondary lobe.*

Additional characters common to the five members of the genus here recognized result from a thorough study of the ample material in the Museum of Comparative Zoology and all known literature up to 1950. Only obvious misprints or miscounts have been omitted from the tabulation and key following.

Rostral broader than deep, visible from above; nostril between two nasals or separated from the posterior one by a narrow rim; internasals more or less narrowly truncate anteriorly, about as long as broad, slightly shorter than, or as long as, the prefrontals; frontal (in the middle) $1\frac{2}{3}$ to 2 ($2\frac{1}{3}$ occasionally in *o. olivacea*) times as long as broad, longer than its distance from the end of the snout, shorter than the parietals; loreal about as long as deep.

In the following tabulation the forms are arranged according to maximum size which shows some correlation with increase in the number of ventrals and subcaudals. WARNING. Many low subcaudal counts (including some of my own) occurring in the literature, are based on individuals with abbreviated *tails whose pointed terminal tips have been regenerated.* Sometimes these are so astonishingly like the original as to have deceived distinguished herpetologists into describing as new species examples of such short-tailed snakes. The matter is complicated by the high percentage (varying from locality

to locality but possibly 30 to 50 percent) of adult snakes that have lost their tails to predators, as can be seen by comparison with the tails of young specimens.

VARIATION IN LEPIDOSIS OF THE SPECIES OF *NATRICITERES* AS OF 1950

Species or race	*Ventrals*	*Anals*	*Subcaudals*	*Maximum length of*		*Maximum length of*	
				♂ *H.& B.*	♂ *Tail*	♀ *H.& B.*	♀ *Tail*
o. pembana	123–127	2	52–61	200 mm.	78 mm.	210 mm.	75 mm.
variegata	124–135	2	64–78	265 mm.	135 mm.	240 mm.	101 mm.
o. uluguruensis	125–144	2	62–84	300 mm.	130 mm.	350 mm.	140 mm.
o. olivacea	128–149	2	[1]57–87	332 mm.	132 mm.	460 mm.	[2]144 mm.
fuliginoides	122–135	1	75–95	370 mm.	[2]186 mm.	310 mm.	?

[1] Possibly, though questionably, the tail of an M.C.Z. snake with 51 subcaudals is intact.
[2] The tail measurements in these two instances are not those of the same snakes as those from which the head and body measurements are taken.

Species or race	*Pre-ocular*	*Post-oculars*	*Temporals*	*Upper Labials*	*Lower Labials*	*Midbody Scale-rows*
o. pembana	1–2	3	1+2	8	8	(15)17
variegata	1–2	(2)3	1+2	(7)8	8–9	(13)15
o. uluguruensis	1(2)	(2)3	(1+1)1+2(2+1)	8(9)	8–10	(15)17(19)
o. olivacea	1(2)	(1)(2)3	(1+1)1+2(1+3)	(7)8(9)	8–10	(17)(18)19
fuliginoides	1–2	(2)3	(1+1)1+2(0+2)	(7)8	8–10	17

Parentheses have been used in the preceding tabulation to indicate unusual variations detected during the examination of over 200 snakes.

Key to the Species and Subspecies of Natriciteres

1. Anal divided 2
   Anal entire 5
2. Midbody scale-rows 19 (rarely 17 or 18); range: swampy lowlands of Anglo-Egyptian Sudan east to extreme southern Somalia, south to Southern Rhodesia (the solitary Salisbury record of 1898), northeast

through Angola and the Belgian Congo to the Gold Coast (a Lagos specimen in the M.C.Z.) ..... *o. olivacea*
Midbody scale-rows 17 or less (rarely 18 or 19) 3

3. Midbody scale-rows 17 (very rarely 13\15, 18 or 19); range: montane marshes and forest fringes of East Africa from Tanganyika Territory south through Mozambique, Nyasaland, and Northern Rhodesia to Southern Rhodesia (Mount Selinda) and western Angola ..... *o. uluguruensis*
Midbody scale-rows 15 (occasionally 13 or 17) 4

4. Subcaudals 52–61; range: an insular form found only on Pemba Island, north of Zanzibar Island ..... *o. pembana*
Subcaudals 64–78; range: French Cameroon west to French Guinea ..... *variegata*

5. Subcaudals 75–95; midbody scale-rows invariably 17 coupled with a single anal; range: Belgian Congo northwest to French Guinea ..... *fuliginoides*

It will be noted that these last two species have almost coextensive ranges and occur in the same localities. In color and pattern they are indistinguishable, a conspicuous light nuchal collar being present in both, yet they appear to be distinct species.

Natriciteres olivacea olivacea (Peters)

Coronella olivacea Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 622: Tete, Mozambique.

Tropidonotus olivaceus Boulenger (part), 1893b, p. 227; 1896d, p. 604; 1897e, p. 800; Johnston, 1898, p. 361a.

5 ♂♂, 2 ♀♀ (M.C.Z. 51041–7) Mtimbuka. 14–19.ii.49.

Records. Karonga to Kondowe (B); Nkata Bay to Ruarwe (B); "Nyika Plateau" (B). For other Nyasaland records see subspecies below.

Native name of Olive Marsh-Snake. *Mbura* (Yao).

Variation. Midbody scale-rows 19; ventrals 134–138; anals 2; subcaudals 57–62; labials 8, fourth and fifth entering the orbit; lower labials in contact with the anterior sublinguals 5–6; preoculars 1–2; postoculars 2–3.

Color. All exhibit a broad, dark, vertebral band; both olive and rosy varieties were collected on the same day following heavy showers. Drought conditions prevented my meeting with the species at Tete.

Size. Largest ♂ (M.C.Z. 51042), 419 (317 + 102) mm.; the smallest a ♀ (taken February 19), measured only 165 (125 + 40) mm. in the field.

Parasites. Cestoda and Pentastomida (U.S.N.M. 47029).

Natriciteres olivacea uluguruensis (Loveridge)

Coronella olivacea var. *dumerilii* Günther, 1894a (1893), p. 618; Johnston, 1897, p. 362; 1898, p. 361a.

Tropidonotus olivaceus Boulenger (part), 1896d, p. 604; 1897e, p. 800; Johnston, 1898, p. 361a.

Natrix olivacea uluguruensis Loveridge, 1935, Bull. Mus. Comp. Zool., **79**, p. 7: Nyange, Uluguru Mountains, Tanganyika Territory.

♂ (M.C.Z. 51048) Cholo Mtn. 17.iii.49.

Records. Mlanje (as Milangi; B); "Zomba" (B). The Montane Marsh-Snake, a forest-fringe form already recorded from Rungwe Mountain by Bogert (1940, p. 35), and ranging as far south as Chirinda Forest, Selinda Mountain, Southern Rhodesia, where three were taken by FitzSimons (1939b, p. 20), though not recorded under this name.

To this race I would also refer the four snakes from Massangulo, Portuguese Niassa (13° 55′ S., 35° 35′ E., Alt. 3375 feet, so apparently in the Mtonia Mountains) referred to "*Tropidonotus* sp." and to the West African "*Tropidonotus fuliginoides*" by Cunha (1935 & 1937). Through the courtesy of Dr. A. A. Themido I have been enabled to examine one of these snakes which is a typical *uluguruensis* with divided anal.

Variation. Midbody scale-rows 17; in all other respects within the range of the typical lowland form.

Enemies. The tail of a Montane Marsh-Snake was disgorged by a Cape File-Snake (*Mehelya c. capensis*) which I captured near Lujeri River, Mlanje Mountain.

Genus Lycodonomorphus

1843 *Lycodonomorphus* Fitzinger, Systema Reptilium, p. 27: genotype: *Coronella rufula* Schlegel = *Coluber rufulus* Lichtenstein.

1848. *Lycodontomorphus* Agassiz, Nomen. Zool. Index Universalis, p. 628: emend. pro *Lycodonomorphus* Fitzinger, 1843.

1860. *Lycodonomorphus* Fitzinger, Sitzungsber. Kais. Akad. Wiss. (Wien), **42**, p. 408: genotype: *Coluber rufulus* Lichtenstein.

1863. *Neusterophis* Günther, Proc. Zool. Soc. London, p. 16, footnote: genotype: *Natrix lacvissima* Günther.

1893b. *Ablabophis* Boulenger, Cat. Snakes Brit. Mus., **1**, p. 318: genotype: *Coluber rufulus* Lichtenstein.

Remarks. Over forty years ago Hewitt (1912, p. 267) pointed out the close affinities of *Ablabophis rufulus* and *Tropidonotus laevissimus* in respect to their dentition. In the number of their pterygoid teeth he found the former had about 34, the latter 30, as against the 16 attributed to *Natrix n. natrix*. Maxillary teeth in *rufulus* were said to be equal and number 20–25 by Boulenger; in *laevissimus* Hewitt found 25, subequal throughout except for a very slight reduction in size posteriorly. Mandibular teeth in *rufulus* and *laevissimus* are longest anteriorly and indistinguishable.

Hewitt concluded that the shape of the pupil was the sole character of generic status separating the two species and questioned whether this was sufficient; nevertheless, for a quarter-century he has continued to treat the two reptiles as generically distinct. While the pupil may be regarded as subcircular or subelliptic in most of the nine *rufulus* in the Museum of Comparative Zoology's collection, it appears to be round in others (M.C.Z. 21306; 21476 for e.g.) as it is in all our *laevissimus*.

More recently Bogert (1940, pp. 5, 11, 18, 32–36) approached the status of African ophidian genera on the basis of their hemipenal characters as well as dentition. He decided to separate *laevissimus*, *olivaceus*, *fuliginoides*, and other smooth-scaled African "*Natrix*" under the name *Neusterophis*. Unfortunately the type species *laevissimus* has the sulcus spermaticus forked, while in *olivaceus* and *fuliginoides* it is not forked.

Lycodonomorphus rufulus mlanjensis subsp. nov.

Type. M.C.Z. No. 51050, an adult male from Ruo River, Mlanje Mountain, Nyasaland. Collected by Arthur Loveridge, April 1, 1949.

Paratypes. M.C.Z. Nos. 51049 and a duplicate now in British Museum (N.H.), being two males from a stream near Nswadzi River, Cholo Mountain, Nyasaland. Collected on 16 and 22, April, 1949. Also an adult female (British Museum, No. 34.2.1.27), from Zomba, Nyasaland.

Diagnosis. Though *L. r. rufulus* is a common South African snake of which many specimens have been collected, only two examples with more than 19 midbody scale-rows have been recorded during the past 125 years. The new form is, therefore, distinguished from all other races of *rufulus*, except *L. r. leleupi* Laurent of the Belgian Congo, by its 21 midbody scale-rows, and in addition from *r. whytii*, the only

other race found north of the Zambezi, by its higher number of subcaudals. Its immaculate throat and belly immediately distinguish it from adults of *L. r. lebeupi* and *L. laevissimus* of South Africa, the only other species in the genus.

Description. Rostral broader than deep, just visible from above; nostril between two nasals, directed upwards; internasals (as long as or) longer than broad, slightly shorter than the prefrontals; prefrontals large, squarish; frontal 1½ (1⅓ to 1 ⅔) times as long as broad, (as long as) or longer than its distance from the end of the snout, shorter than the parietals; loreal longer than deep, well separated from the first labial; preocular 1; postoculars 2; temporals 1 + 2; upper labials 8, fourth and fifth entering the orbit; lower labials 8, first four in contact with the anterior sublinguals, which are subequal to the posterior. Midbody scale-rows 21; ventrals (163–) 167 (169 in ♀ paratype); anal entire; subcaudals 71 (51 in ♀ paratype; 60 & 66 in the paratype ♂♂ whose tail-tips may possibly be missing).

Color. Above, glossy black; upper and lower lips white, the upper heavily infuscated, the lower only anteriorly so; the lowest scale-row and edges of the next one above it whitish, more or less obscured by dusky infuscations. Below, faintly pinkish white; throat to anus immaculate except for tiny flecks on three ventrals; tail with a dark median line formed of dusky spots (ending an inch from the tip in one paratype).

Size. Total length of type ♂ (M.C.Z. 51050), 735 (550 + 180) mm., of paratype ♂♂, 516 (405 + 111) mm., and 479 (377 + 102) mm., the tails being .24 per cent, .21 per cent and .21 per cent of their respective total lengths.

Diet. A large ranid tadpole in the stomach of the type.

Parasites. Nematode worms (*Kalicephalus* sp.; immature Ascaridae; also larval Anisakinae, probably *Cleoascaris* sp.) were abundant in the type.

Temperament. Even Africans appear to recognize the docility of this species as will be seen from remarks under habitat.

Native name of the Mlanje Water-Snake. *Chirumi* (Manganja).

Habitat. Immediately after more than forty hours incessant rain, a small boy named Harry arrived in camp with the first snake (M.C.Z. 51049) which, quite unharmed, he had confined in a receptacle made of banana stem. He said he had caught the reptile in a small stream that flows into the Nswadzi River about three miles north of my camp (Cholo Mtn., 16.iii.49).

As Harry failed to return, though I had urged him to try and obtain further specimens, I set out to find the place from which the snake had come. A friend of Harry's conducted me to the precise spot on Muyenda stream where they had found it. The shallow, ankle-deep stream was flowing among numerous well-rounded stones between almost vertical banks varying in height from four to six feet. Two men who said they were familiar with the ways of *chirumi*, appeared from nearby huts and began groping for the snakes beneath the stones in much the same way as one would tickle for trout. In this fashion, with Thomas and I following at their heels, we worked upstream for a hundred yards turning every movable boulder but without result.

Half-a-dozen small boys "assisted", while from the bank above as many little girls with sparkling eyes watched us. One three-year-old started to run each time I happened to look in her direction, then broke into peals of laughter. When we abandoned our fruitless search and toiled back up the steep path that led past the half-dozen huts, one of which was Harry's home, two toddlers on the mud "veranda" of a hut fled, one infant crying at the sight of this apparition. At such childishness the three-year-old, now following at my heels, laughed scornfully. (Muyenda Stream, 21.iii.49).

Lycodonomorphus rufulus whytii (Boulenger)

Glypholycus whytii Boulenger, 1897c, Proc. Zool. Soc. London, pp. 800, 802, pl. xlvi, fig. 2: Fort Hill, 4000 feet, Nyasaland. Johnston, 1898, p. 361a; Boulenger, 1915c, p. 619; Werner, 1929a, p. 50.

Records. When passing through Fort Hill we made enquiries regarding this Whyte's Water-Snake, of which the female type is still the only known Nyasaland example. Conditions at Fort Hill may have been different in Whyte's time, but today its arid surroundings appeared an unlikely place in which to find such a water-loving species. One wonders whether the type could possibly have come from the not too distant Misuku Mountains where streams were formerly plentiful and suitable habitats for a montane-torrent snake still to be found.

I am informed by Dr. A. A. Themido that the two snakes from Massangulo, Portuguese Nyasaland, recorded as *Ablabophis rufulus* by Cunha (1935, p. 5), were actually *Boaedon l. lineatus*. The scale counts furnished by Cunha are not those of his specimens but were taken from Boulenger's (1893b, p. 318) catalogue. *Ablabophis whytii* was found at Charre, Mozambique, by Cott (1935, p. 965), and

recorded from Rungwe Mountain, to the north of Fort Hill, by Bogert (1940, p. 18). Unfortunately *Ablabophis* Boulenger (1893b) is antedated by *Lycodonomorphus* Fitzinger (1843) for both designated *Coluber rufulus* Lichtenstein (1823) as genotype.

Boaedon lineatus lineatus Duméril & Bibron

Boaedon lineatum Duméril et Bibron, 1854, Erpét. Gén., **7**, p. 363: Gold Coast.
Boodon lineatus Günther, 1893 (1892), p. 555; Boulenger, 1893b, p. 332; 1896d, p. 616; 1897e, p. 801; Johnston, 1897, p. 362; 1898, p. 361a.
Boaedon lineatus lineatus Bogert, 1940, p. 21.

♂, 4 ♀ ♀ (A.M.N.H. 67744–8) Nchisi Mtn. vii–ix.46.
♂ (A.M.N.H. 67741) Zomba Plateau. v–vi.46.
♂ (A.M.N.H. 67756) Likabula River. vi–vii.46.
2 ♀ ♀ (M.C.Z. 51051–2) Misuku Mtns. 4.x.48.
♂ (M.C.Z. 51053) Nyika Plateau. 15.xi.48.
♂ (M.C.Z. 51054) Nchenachena. 20.x.48.
♂ (M.C.Z. 51055) Vipya Plateau. 17.ix.48.
2 ♂♂, 5 ♀ ♀ (M.C.Z. 51056–60) Nchisi Mtn. xi–xii.48.
♀ juv. (M.C.Z. 51061) Chitala River. 14.xii.48.
3 ♂♂, 3 ♀ ♀ (M.C.Z. 51062–7) Mtimbuka. 11–28.ii.49.
2 ♀ ♀ juv. (M.C.Z. 51068–9) Lake Malombe. 25.ii.49.
♂ (M.C.Z. 51070) Zomba Plateau. 2.ix.48.
♂ ♀ (M.C.Z. 51071–2) Likabula River. 5–6.viii.48.
3 ♂♂, 3 ♀ ♀ (M.C.Z. 51073–8) Ruo River. 1–8.iv.49.
7 ♂♂, 4 ♀ ♀ (M.C.Z. 51080–90) Cholo Mtn. 11–25.iii.49.
♂, 2 ♀ ♀ (M.C.Z. 51091–3) near Tete. 13.i.49.
♂ (M.C.Z. 51094) Beira. 17.vii.48.

Records. Blantyre (B); Fort Hill (B); Karonga (Bogert); Karonga to Kondowe (B); Mlanje (Bogert); Nkata to Ruarwe (B); "Nyika Plateau" (B); Shire Valley (G); Zomba (B). In addition to some of the foregoing localities Mr. Mitchell informs me he has taken this species at Fort Johnston.

Native names of the Brown House-Snake. *Chakusa* (Nyanja); *chigonakusa* (Manganja); *kajengamauta*! (Yao); *mburu* (Chewa & Ngoni). Unfortunately this useful reptile, especially in its blackish phases, is commonly supposed by both Africans and Europeans to be the young of cobra or mamba, the Misuku assuring me that *swera* was the correct name and some Nyanja mistakenly calling it *mamba*.

Variation. Midbody scale-rows 25–33 (usually 27–29, for only eight of the fifty-four snakes possess 25 (2), 31 (5), or 33 (1); ventrals

199–227 (see below for sexual differences); anal entire; subcaudals 44–67; upper labials 8, the fourth and fifth, or third, fourth and fifth (in two snakes only) entering the orbit; lower labials 8–10, the first 2–5 (usually 4) in contact with the anterior sublinguals; loreal 1; preocular 1 (43 sides) or 2 (61 sides), the former condition being usual on Zomba and Mlanje snakes, the latter (*bipraeocularis* Günther) normal for those from Mtimbuka and Cholo; temporals 1 + 2, except on one side of four snakes which have 1 + 3.

Size. Largest ♂ (M.C.Z. 51070), 708 (590 + 118) mm.; largest ♀ (M.C.Z. 51051), 927 (810 + 117) mm.

Sexual dimorphism. The following extremes of range have been subjected to very careful rechecking:

In 19 males the range of ventrals is 199–211; of subcaudals 55–67; and the tail is .14 (1 ex.) to .18 (1 ex.) per cent of *total* length.

In 23 females the range of ventrals is 214–227; of subcaudals 44–55; and the tail is .11 to .12 per cent of *total* length.

Breeding. The only females with developing eggs were taken: On August 5, at Likabula River, a ♀ held 6 eggs measuring 10 x 5 mm. On October 10, in the Misukus, a ♀ held 14 eggs measuring 13 x 7 mm.

Diet. A mouse (*Leggada triton murilla* in stomach of an Nchisi snake; the undigested hind half of a reddish brown *Pelomys*-like *rumbi* rat (*Lemniscomys griselda calidior*) at Likabula; a gecko (*Hemidactylus mercatorius*) and its separated tail in a Kasumbadedza snake. Stomachs empty in remaining 49 snakes!

Parasites. Roundworms (*Kalicephalus* sp.; *Ophidascaris* sp.) were present in the stomachs of snakes from the Misuku, Nyika, and Nchisi Mountains. Tapeworms (U.S.N.M. 41282, 41285) in those from the Misuku Mountains and Likabula River.

Enemies. Of these 52 snakes, 6 ♂♂ and 4 ♀♀ had lost the tips of their tails previous to capture.

Aestivation? It seems more than a coincidence that during the hot weather in the lowlands, i.e. mid-December to mid-March, only juvenile house snakes (with overall measurements ranging from 242 to 272 mm.) were encountered. Possibly unappeased hunger in the young causes them to be more active at such times. After three days heavy rain on the Ruo River, two fine adult males with empty stomachs were brought in.

Habits. It is their search for rodents that induces hungry house snakes to frequent buildings, where their climbing prowess occasionally lands them in unexpected places. At Mtimbuka as I took hold of the

bathroom door late one night, I felt something soft squirm beneath my grasp, a light revealed it as the tail and posterior portion of an eighteen-inch house snake whose body lay along the lock while the head was searching for an exit between the ill-fitting door and its frame.

Lycophidion capense capense (Smith)

Lycodon capensis A. Smith, 1831, S. African Quart. Journ., **1**, p. 18: Kurrichane, *i.e.* Rustenberg District, Transvaal.

Lycophidium horstockii Günther, 1893 (1892), p. 555: Johnston, 1897, p. 362; 1898, p. 361a.

Lycophidium capense Boulenger, 1893b, p. 339; 1896d, p. 616.

Lycophidion capense capense Bogert, 1940, p. 30.

♀ (A.M.N.H. 67793) Kotakota. viii–x .46.
♀ (M.C.Z. 51095) Cholo Mtn. 21.iii.49.

Records. Mlanje Mtn. (Bogert); Shire Highlands (G); Zomba (B).

Variation. Midbody scale-rows 17; ventrals 190–198; anal 1; subcaudals 31–39; labials 8, the third, fourth and fifth entering the orbit; lower labials 8, the first 5 in contact with an anterior sublingual; preocular 1; postoculars 2; temporals 1 + 2.

Color. Throat of Cholo snake white, less so in the Kotakota specimen; ventrals plumbeous more (anteriorly) or less (posteriorly) edged with white.

Size. Larger ♀ (A.M.N.H. 67793), 457 (415 + 42) mm.

Diet. A skink (*Mabuya v. varia*) recovered from the stomach of the Cholo snake. In view of the abundance of this skink throughout Nyasaland, the scarcity (as shown by my securing only one in eight months) of *L. c. capense* is surprising, for the reptile is abundant in Tanganyika Territory.

Mehelya capensis capensis (Smith)

Heterolepis capensis A. Smith, 1847, Illus. Zool. S. Africa, pl. lv: Eastern districts of Cape Colony.

Simocephalus capensis Boulenger, 1896d, p. 617.

Mehelya capensis capensis Loveridge, 1939c, p. 142 (generic revision).

♂ (M.C.Z. 51096) Mtimbuka. 4.iii.49.
♂ (M.C.Z. 51097) Lujeri River. 2.iv.49.

Records. Zomba (B).

Native name of Cape File-Snake. *Gulambila* (Yao, but generic); *nyoka ndalu* (Nyanja on Mlanje).

Variation. Midbody scale-rows 15; ventrals 211–220; anal 1; subcaudals 56–58; upper labials 6–7, the third and fourth entering the orbit; lower labials 8, the first four in contact with an anterior sublingual; loreal 1; preocular 1; postoculars 2; temporals 1 + 2.

Color. It is interesting to note that the ground color of both these *young* males approaches that of *nyassae* except for the pure white vertebrals, being black above, but pure white below.

Size. Larger ♂ (M.C.Z. 51096), measures 573 (500 + 73) mm.

Diet. The tail of a young sand snake (*Psammophis s. sudanensis*) was present in the stomach of the Mtimbuka snake, while the Lujeri reptile disgorged the tail of a Montane Marsh-Snake (*Natriciteres o. ulugurucnsis*) when handled.

Temperament. The Lujeri snake was lying coiled beneath an uprooted stump close to the river. When I picked it up it made no attempt to bite, but flattened its throat slightly and disgorged the tail as related above.

Mehelya nyassae (Günther)

Simocephalus nyassae Günther, 1888b, Ann. Mag. Nat. Hist. (6), **1**, p. 328: Lake Nyasa, Nyasaland. Boulenger, 1891a, p. 306; 1893b, p. 347, pl. xxiii, fig. 2; Sternfeld, 1910a, p. 17.

Mehelya nyassae Loveridge, 1939c, p. 148 (generic revision).

♂ ♀ (M.C.Z. 51098–9) Mtimbuka, L. Nyasa. 9–10.ii.49.

Records. Lake Nyasa (G).

Native name of Nyasa File-Snake. *Gulambila* (Yao, but generic).

Variation. Midbody scale-rows 15; ventrals 173–174; anal 1; subcaudals 71–68+ (tip missing); upper labials 6, third and fourth entering the orbit; lower labials 7, the first five in contact with an anterior sublingual; loreal 1; preocular 1; postocular 1; temporals 1 + 2.

The previous recorded range for subcaudals was 55–63, but at the time my (1939c, p. 148) revision was published only seven specimens were known, possibly all females, though one of Werner's types of *Gonionotophis degrijsi* was said to be a male.

Color. Above, uniform black; below, brownish black, each ventral edged with lighter.

Size. Total length of ♂, 401 (390 + 111) mm.; of ♀ 464+ (360 + 103+) mm., tail-tip missing.

Philothamnus hoplogaster (Günther)

Ahaetulla hoplogaster Günther, 1863, Ann. Mag. Nat. Hist. (3), **11**, p. 286: "Port Natal," i.e. Durban, Natal, Union of South Africa.

Philothamnus neglectus Peters, 1866, Monatsb. Akad. Wiss. Berlin, p. 890: Praso Boror, Mozambique.

Ahaetulla neglecta Günther, 1894a (1893), pp. 618, 620; Johnston, 1897, p. 362; 1898, p. 361a.

Chlorophis hoplogaster Boulenger (part), 1894a, p. 93; Bogert (part), 1940, p. 54.

Chlorophis neglectus Boulenger (part), 1894a, p. 94; 1896d, p. 361.

♂♂ (M.C.Z. 51101–2) Misuku Mtns. 6.x.48.
♂ (M.C.Z. headless) Nchenachena. 20.xi.48.
♂ (M.C.Z. 51103) Nchisi Mtns. 10.xii.48.
♀ (M.C.Z. 51104) Chitala River. 18.xii.48.
♂ (M.C.Z. 51105) Chowe. 12.ii.49.
♀ (M.C.Z. 51106) Zomba Mtn. 7.ix.48.
♀ (M.C.Z. 51107) Cholo Mtn. 23.iii.49.
♀ (M.C.Z. 51108) Ruo River. 4.iv.49.

Records. Occurs with *irregularis* at Misuku; Nchenachena; Nchisi; Cholo and Ruo River, Mlanje Mtn. Blantyre (also Mandala Hill; B); Karonga (Bogert); Mlanje Mtn. (G.; B); Shire Highlands (G.; B); Zomba (G.; B).

Native names of Southeastern Green-Snake. *Nalwinduwindu* (Misuku); *namasamba* (Nyanja, but not even generic); *nyoka msipu* (Chewa; Ngoni).

Variation. Midbody scale-rows 15; ventrals 145–158; anals 2; subcaudals 80–92; upper labials 8, rarely 7 or 9, the fourth and fifth, rarely the third and fourth (M.C.Z. 51107), or fifth and sixth (left side only of M.C.Z. 51102) entering the orbit; lower labials 9–11, the first four, five or six in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 1 + 1, or 1 + 0 (in M.C.Z. 51004 only, where the seventh labial is in contact with the parietal on both sides).

Color. On the nape and anterior part of the back of both a ♂ hatchling (ex. Chowe) and ♂ adult (ex. Misuku) are a dozen pairs of jet black spots, or crossbars formed by the coalescence of a pair of spots, set off handsomely by the rich velvety green ground color.

Size. Largest ♂ (M.C.Z. 51101), 720 (500 + 220) mm.; ♀ (M.C.Z. 51106), 616 (465 + 151) mm.; hatchling ♂ (M.C.Z. 51105), 193 (140 + 53) mm.

Breeding. On December 18, at Chitala, a ♀ held 6 eggs measuring

20 x 28 mm. On February 12, at Chowe, a hatchling measured 3 mm. longer than it now does in alcohol (*vide supra*).

Enemies. A ♀, with only a stump of tail left, was brought to me on our fourteenth day on Cholo Mountain, evidence of the relative rarity of this species there as compared with *irregularis*. It also happened to be the fourteenth species of snake obtained during our fortnight on Cholo.

Habits. A ♂ was basking on a sunlit patch of leaf-strewn ground fifty feet or so inside the forest fringe. It darted downhill and then ascended a sapling where I shot it.

Philothamnus irregularis irregularis (Leach)

Coluber irregularis Leach, 1819, in Bowdich, Mission to Ashantee, p. 494: Ashanti, Gold Coast.

Ahaetulla shirana Günther, 1888b, Ann. Mag. Nat. Hist. (6), **1**, p. 326: Blantyre Mission, Shire River, Nyasaland.

Chlorophis irregularis Boulenger, 1891a, p. 306; 1894a, p. 96; 1896d, p. 631; 1897e, p. 801; Johnston, 1898, p. 361a; Bogert, 1940, p. 53.

Ahaetulla irregularis Günther, 1893 (1892), p. 555; Johnston, 1897, p. 362; 1898, p. 361a.

2 ♂♂, 1 ♀ (A.M.N.H. 67752–4) Nchisi Mtn. 23.vii–13.ix.46.
1 ♂, 3 ♀♀ (A.M.N.H. 67787–90) Cholo Mtn. 18.ix–1.x.46.
2 ♂♂, 1 ♀ (A.M.N.H. 67765–7) Likabula R. 19.vi–18.vii.46.
1 ♂, 3 ♀♀ (M.C.Z. 51009–12) Misuku Mtns. 9–14.x.48.
♂ (M.C.Z. 51113) Nchenachena. 20.xi.48.
2 ♀♀ (M.C.Z. 51114–5) Mtimbuka. 12–15.ii.49.
♂ (M.C.Z. 51116) Chiradzulu Mtn. 31.viii.48.
♀ (M.C.Z. 51117) Limbe. 16.iv.49.
2 ♂♂, 6 ♀♀ (M.C.Z. 51118–25) Cholo Mtn. 11–26.iii.49.
3 ♂♂, 1 ♀ (M.C.Z. 51126–9) Ruo River. 1–9.iv.49.

Records. Occurs with *hoplogaster* at Misuku, Nchenachena; Nchisi; Cholo and Ruo River, Mlanje Mtn. Blantyre Mission (G); Blantyre (Mandala Hill; B); Fort Hill (B); Karonga to Kondowe (B); Mlanje Mtn. (B and Bogert); "Nyika Plateau" (B); Shire Valley (B).

Native names of Western Green-Snake. *Nalwinduwindu* (Misuku; but not even generic); *namasamba* (Manganja; Nyanja; Yao; but not even generic).

Variation. Midbody scale-rows 15; ventrals 152–163; anals 2, rarely 1 (M.C.Z. 51110 only); subcaudals 97–121; upper labials 9, rarely 8 or 10, the fourth, fifth and sixth, rarely the third, fourth and fifth; fifth

and sixth (A.M.N.H. 67766[1] and right side only of M.C.Z. 51125); or fifth, sixth and seventh, entering the orbit; lower labials 8–11 (usually 9–10), the first four, five or six in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 1 + 1 (35 sides), 1 + 2 (26 sides), or 1 + 0 (in M.C.Z. 51111 only, where the seventh labial is in contact with the parietal on both sides).

Color. On the nape and anterior part of the back of a young ♀ (ex. Mtimbuka) are faint indications of dark crossbars as in both *Philothamnus s. semivariegatus* and *P. hoplogaster.*

Size. Largest ♂ (M.C.Z. 51116), 1037 (700 + 337) mm.; ♀ (M.C.Z. 51120), 1080+(785 + 295+) mm., the next largest perfect ♀ (A.M.N.H. 67788) measuring 1059 (745 + 314) mm., the smallest ♀ (M.C.Z. 51115), 274 (196 + 78) mm.

Breeding. On September 30, on Misuku, a ♀ held 11 eggs measuring about 15 x 11 mm. On October 9, on Misuku, a ♀ held 7 eggs measuring 30 x 12 mm., and obviously ready for laying.

Diet. Two *Rana o. gribinguiensis* in two Cholo snakes; remains of a *Hyperolius* sp. in a Mtimbuka reptile.

Enemies. Two *irregularis* were recovered from the stomachs of *Thelotornis k. capensis* on Cholo Mountain.

Habits. The biggest male was found among recently scythed grass drying in hot sunshine on the slopes of Mount Chiradzulu. After being disturbed, the reptile dashed wildly hither and thither for some time before I managed to intercept and catch it.

Philothamnus semivariegatus semivariegatus (Smith)
Plate 4, figure 1

Dendrophis (*Philothamnus*) *semivariegata* A. Smith, 1840, Ill. Zool. S. Africa, Rept., pls. lix, lx, lxiv, figs. 1a–1b: Bushman Flat, Cape Province (restricted by Bogert, 1940, p. 56).

Philothamnus semivariegatus Boulenger, 1891a, p. 307; 1894a, p. 99; 1896d, p. 631; 1897e, p. 801; Johnston, 1898, p. 361a.

♀ (A.M.N.H. 67762) Likabula River. 19.vi–18.vii.46.
♀ (M.C.Z. 51130) Misuku Mountains. 14.x.48.
♂ (M.C.Z. 51131) Chitala River. 18.xii.48.
2 ♂♂, 1 ♀ (M.C.Z. 51132–4) near Tete. 10–22.i.49.

Records. Blantyre (B); Fort Hill (B); Karonga to Kondowe (B);

[1] Clearly not *hoplogaster* by its 119 subcaudals.

Lake Nyasa (B); "Nyika Plateau" (B); Shire River (B); Shire Valley (B).

Native names of Spotted Bush-Snake. *Changa* (Yao); *nyalwinduwindu* (Misuku, but not even generic); *nyoka masamba* (Nyungwe).

Variation. Midbody scale-rows 15; ventrals 169–196; anals 2; subcaudals 138–142+; upper labials 9, rarely 10, the fourth, fifth and sixth, or fifth and sixth only, or fifth, sixth and seventh entering the orbit; lower labials 9–10, the first four or five in contact with the anterior sublinguals; preocular 1, postoculars 2; temporals 1 + 1 (1 side), 1 + 2 (5 sides), or 2 + 2 (6 sides).

Size. Largest ♀ (M.C.Z. 51133), 1020 (720 + 300) mm.

Breeding. On October 14 in the Misuku Mtns. a ♀ held 5 eggs each measuring about 41 x 12 mm.

Diet. A Tete ♀ held the tails only of two large *Pachydactylus b. turneri*, the geckos themselves having escaped.

Defence. The fine Chitala ♂, captured alive, inflated its throat vertically as its photograph was being taken.

Meizodon semiornata (Peters)

Coronella semiornata Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 622: Mozambique. Boulenger, 1894a, p. 359.

Records. Lake Nyasa (B).

Remarks. Boulenger does not mention the collector of this specimen which has not been taken since in Nyasaland. It was Bogert (1940, p. 50) who pointed out that *Meizodon* Fischer, 1856, should be applied to the African snakes customarily referred to the European genus *Coronella*. *C. s.* var. *mossambicae* Cott, 1935 (1934) is a synonym.

Pseudaspis cana (Linné)

Coluber canus Linné, 1758, Syst. Nat. ed. 10, **1**, p. 221: "Indiis."
Pseudaspis canus Boulenger, 1896d, p. 620.

Records. Chiradzulu (B); Zomba (B).

Remarks. Not since Sir Harry Johnston secured the two male Mole Snakes listed above, does anyone seem to have collected further examples of this big snake in Nyasaland. I completely failed to do so though constantly on the lookout for it at Chiradzulu and Zomba.

Duberria lutrix shirana (Boulenger)

Homalosoma lutrix Günther (not Linné), 1893 (1892), p. 555; Johnston, 1897, p. 362; 1898, p. 361a.

Homalosoma shiranum Boulenger, 1894a, Cat. Snakes Brit. Mus., **2**, p. 276, pl. xiii, fig. 1: Shire Highlands, Nyasaland.

Duberria lutrix shiranum Loveridge (part), 1933h, pp. 241–244, and as *shirana*, 1942e, p. 281.

♀ (A.M.N.H. 67783) Lichenya Plateau. 24.vi–18.vii.46.
♂ (M.C.Z. 51135) Zomba Plateau. 4.ix.48.
2 ♂♂, 1 ♀ (M.C.Z. 51136–8) Nyika Plateau. 8–15.xi.48.

Records. As the Shire Highlands (G) was used chiefly for Zomba and Mlanje Mountains, the first two specimens are topotypic.

Variation. Midbody scale-rows 15; ventrals 128–137; anal 1; subcaudals 32–48; upper labials 6, the third and fourth entering the orbit; lower labials 6–7, the first three in contact with the sublinguals; no loreal; preocular 1; postocular 1 except for 2 on one side of one Nyika snake.

Color. Belly on one Nyika ♂ appears almost uniformly white, of the other Nyika ♂ largely black as in *atriventris* Sternfeld.

Size. Largest ♂ (M.C.Z. 51136), 310 (247 + 63) mm.; and ♀ (M.C.Z. 51137), 251 (300 + 51) mm.

Breeding. In early July a ♀ held 8 eggs measuring about 13 x 6.5 mm. On November 8 the other ♀ held 14 large ova or embryos.

Diet. A slug in one.

Habits. I took the gravid ♀ at 8 A.M. as she basked in weak sunshine, somewhat sheltered from a cold wind by the grassy tussock among whose stems she was entwined. The ♂♂ were taken on the same inhospitable plateau at 7000 feet at 7.50 and 10 A. M. respectively. The Zomba ♂ at noon among stones on the eroded hillside above the Governor's cottage.

Prosymna lineata (Peters)

Temnorhynchus lineatus Peters, 1871a, Monatsb. Akad. Wiss. Berlin, p. 568: Matlale, Gazaland, Mozambique.

1 (M.C.Z. 51144) Kasumbadedza near Tete. 18.i.49.

Remarks. Our specimen is only the third example of this distinctive species to be taken in eighty years. The second, from the port of

Angoche, was referred by Bocage (1882a) first to *frontalis*, and subsequently (1896a) to *sundevallii*. Though my tailless specimen is too damaged to provide accurate ventral counts, in all ascertainable respects it conforms to Peters' description of his type.

Enemies. The much-chewed remains of this large species were taken from the stomach of a topotypic Mozambique Genet (*Genetta t. mossambicus*) that I shot, shortly after sun-up, as it was basking high up in a big baobab.

Prosymna ambigua stuhlmanni (Pfeffer)

Prosymna ambigua Boulenger (not of Bocage), 1891a, p. 300; 1894a, p. 248.
Ligonirostra stuhlmanni Pfeffer, 1893, Jahrb. Hamburg. Wiss. Anst., **10**, p. 78, pl. i, figs. 8–10: Usambara, Tanganyika Territory.

2 ♂♂, 2 ♀♀ (M.C.Z. 51139–42) Mtimbuka. 8–26.ii.49.
♂ (M.C.Z. 51143) Kasumbadedza near Tete. 18.i.49.

Records. Shire Valley (B).

Native name of the East African Shovel-snout. *Tupilinongo* (Yao).

Variation. Midbody scale-rows 15; ventrals 138–154; anal entire; subcaudals 20–32; upper labials 6, the third and fourth entering the orbit.

Size. Largest ♀ (M.C.Z. 51141), 260 (238 + 22) mm.; largest ♂ (M.C.Z. 51143), 236 (202 + 34) mm.; hemipenis of a ♂ with a 31 mm. tail measured 28 mm. unstretched.

Breeding. On February 26, ova were not developed in an adult ♀.

Diet. One stomach held a young gecko (*Hemidactylus mercatorius*, possibly *mabouia*).

Habitat. One was found beneath a bundle of grass on the porch of a hut, another under a rotting log that harbored many small lizards.

Dasypeltis scaber scaber (Linné)

Coluber scaber Linné, 1758, Syst. Nat. ed. 10, **1**, p. 223: "Indiis."
Dasypeltis scabra Günther, 1894a (1893), pp. 618, 619; Boulenger (part), 1894a, p. 353; 1897e, p. 801; Johnston, 1897, p. 362; 1898, p. 361a.
Dasypeltis scaber var. *mossambicus* Peters, 1864a, Monatsb. Akad. Wiss. Berlin, p. 644, footnote: Boror and Tete, Mozambique.

♀ (M.C.Z. 51147) Cholo Mtn. 20.iii.49.
♂ ♀ (M.C.Z. 51145–6) near Tete. 8–28.i.49.

Records. Kotakota (in Brit. Mus.); "Nyika Plateau" (B); Shire Highlands (G); Zomba (B).

Remarks. The two snakes from Kasumbadedza are topotypes of *mossambicus* Peters, a synonym of the typical form which is largely associated with rivers and marshes. The Cholo snake came from about 4000 feet.

Native name of the Rhombic Egg-eater. It was given as *mberenga* (Nyungwe), presumably due to confusion with *Telescopus s. semiannulatus.*

Variation. Midbody scale-rows 25; ventrals 225–244; anal entire; subcaudals 59–62; upper labials 6–7, the second, third and fourth (unusual), third only (through fusion), or third and fourth (normal) entering the orbit; preocular 1; postoculars 0 (due to fusion with labial), 1 (unusual) or 2 (normal); temporals 2 + 3 and 2 + 4.

Diet. The stomach of the juvenile taken on January 8, was full of yolk. Nesting seasons of birds and the prolonged drought were probably responsible for six months elapsing before I obtained the first example of this common reptile.

Dasypeltis scaber palmarum (Leach)

Coluber Palmarum Leach, 1818, in Tuckey, Explor. River Zaire, App., p. 408: Embomma, i.e. Boma, Belgian Congo.

Dasypeltis scabra Boulenger (part), 1897e, p. 801.

Records. Fort Hill (B: as *scabra*).

Variation. A pair (♂ and ♀) from Fort Hill, which I examined at the British Museum, unquestionably belongs to this uniformly-colored montane forest race. Midbody scale-rows 24–25; ventrals 202–241; anal entire; subcaudals 57–67; upper labials 7, the third and fourth entering the orbit; preocular 1; postoculars 2; temporals 2 + 3.

Size. Length of ♂, 482 (389 + 93) mm.; of ♀, 755 (660 + 95) mm.

Dasypeltis scaber medici (Bianconi)

Dipsas medici Bianconi, 1859, Mem. Accad. Sci. Bologna, **10**, p. 501, pl. xxvi: Mozambique.

Dasypeltis scabra Günther (part), 1894a (1893) pp. 618, 619. Boulenger (part), 1894a, p. 353; 1897e, p. 801.

♂ (M.C.Z. 51148) Cholo Mtn. 21.iii.49..

Records. Nkata Bay to Ruarwe (B. as *scabra*); Zomba (G. & B. as *scabra*).

Variation. Midbody scale-rows 23; ventrals 250; anal entire; subcaudals 90; upper labials 7, the third and fourth entering the orbit; preocular 1; postoculars 2; temporals 3 + 4.

Size. Length 689 (570 + 119) mm.

Remarks. This race, recorded from Nyasaland for the first time, is readily recognizable by its more numerous subcaudals in both sexes and its pinkish brown coloring.

Habitat. Such coloring I have always found associated with the red laterite soils of which the foothills of Cholo Mountain are largely composed. Fortunately I met the man, carrying this snake, a mile below my camp, so it came from an altitude of about 3,000 feet.

Telescopus semiannulatus semiannulatus Smith

Telescopus semiannulatus A. Smith, 1849, Illus. Zool. S. Africa, Rept., pl. lxxii: South Africa (by inference).

Leptodeira semiannulata Boulenger, 1891a, p. 307.

Tarbophis semiannulatus Boulenger, 1896d, p. 51; 1897e, p. 801; Johnston, 1898, p. 361a.

♀ (M.C.Z. 51149) near Tete. 24.i.49.

Records. Karonga to Kondowe (B); Lake Nyasa (B); Nkata Bay to Ruarwe (B); "Nyika Plateau," (B: but a highly improbable record for this lowland snake).

Native name of the Tiger Snake. *Mberenga* (Nyungwe: but also applied to the Egg-eating Snake with which it is at times confused).

Variation. Midbody scale-rows 19; ventrals 235; anals 2; subcaudals 69; upper labials 8, the third, fourth and fifth (left), or third, fourth, fifth and sixth (right) entering the orbit; preocular 1; postoculars 2; temporals 2 + 2.

Color. About 24 blotches on the dorsum, and a further 6, scarcely distinguishable, on the tail.

Size. Length of ♀, 852 (730 + 122) mm.

Breeding. On January 24, this ♀ held 10 eggs each measuring about 28 x 10 mm.

Diet. The intestines held the apparently indigestible derm of a large gecko (*Pachydactylus b. turneri*).

Crotaphopeltis hotamboeia hotamboeia (Laurenti)

Coronella hotamboeia Laurenti, 1768, Syn. Rept., p. 85: India orientali, i.e. Africa.

Leptodira rufescens Günther, 1893 (1892), p. 555; Johnston, 1897, p. 362; 1898, p. 361a.

Leptodira hotamboeia Boulenger, 1896d, p. 89; 1879e, p. 801; Johnston, 1898, p. 361a.

Crotaphopeltis hotamboeia hotamboeia Bogert, 1940, p. 62.

Tarbophis barnumbrowni Bogert, 1940, Bull. Am. Mus. Nat. Hist., **77**, p. 66, fig. 9: Jigjiga, Ethiopa. Parker, 1949, p. 85.

♂ (M.C.Z. 51157) Vipya Plateau. 17.ix.48.
2 ♀♀ (M.C.Z. 51158–9) Chitala R. 16–18.xii.48.
2 ♂♂, 2 ♀♀ (M.C.Z. 51160–3) Cholo Mtn. 18.iii.49.
♀ (M.C.Z. 51164) Ruo R., Mlanje Mtn. 8.iv.49.

Records. Blantyre (M); Chiromo (M); Fort Hill (B); Karonga (Bogert); Karonga to Kondowe (B); Misuku Mtns[1]. (B); Mlanje (Bogert); Nyika District and "Plateau" (B); Shire Highlands (G); Zomba (B).

Variation. Midbody scale-rows 19; ventrals 157–167; anal 1; subcaudals 29–46; upper labials 8, the third, fourth and fifth, or fourth and fifth, entering the orbit; lower labials 9–10, the first four or five in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 1 + 2.

Size. Largest ♂ (M.C.Z. 51157), 603 (530 + 73) mm.; largest ♀ (M.C.Z. 51158), 601 (540 + 61) mm.

Remarks. The opportunity is taken of referring to the synonymy of *hotamboeia, Tarbophis barnumbrowni,* a disposition with which its author concurs. It also serves the purpose of directing attention to the exceedingly close relationship between *Crotaphopeltis* and *Telescopus,* a name that was not preoccupied by *Telescopium* Montfort (1810) though Boulenger (1896d) mistakenly supposed it was and consequently employed the name *Tarbophis* which has been in general use ever since.

Breeding. On December 18, at Chitala River, a ♀ held 10 eggs measuring 15 x 8 mm.; though ova were small in another ♀ taken two days earlier at the same place.

Diet. One of these Savanna White-lipped Snakes from Chitala River was taken in the act of swallowing an adult toad (*Bufo carens*) while

[1] Midbody scale-rows 19 (*fide* H. W. Parker in letter: 1.v.51).

the stomach of the second was almost incredibly distended with another full-grown *carens*. The Ruo reptile held the undigested hind limbs of a frog (*Rana f. angolensis*), and one of the Cholo series a *Breviceps mossambicus*.

Crotaphopeltis hotamboeia tornieri (Werner)

Leptodira tornieri Werner, 1908 (1907), Sitzb. Akad. Wiss. Wien, **116**, Abt. **1**, p. 1875: Amani, Usambara Mtns., Tanganyika Territory.

2 ♂♂, 4 ♀♀ (M.C.Z. 51151–6) Misuku Mtns. 27.ix–8.x.48.

Records. New to Nyasaland, the most southerly record for this somewhat dwarfed, virgin-forest race found in the Usambara, Uluguru, Uzungwe, Ukinga and Rungwe Mtns.

Native name of the Sylvicoline White-lipped Snake. *Nawatonto* (Misuku).

Variation. Midbody scale-rows 17; ventrals 156–168; anal 1; subcaudals 36–48; upper labials 8–9, the fourth and fifth, or fourth, fifth and sixth (M.C.Z. 51155 only) entering the orbit; lower labials 8–10, the first four or five in contact with the anterior sublinguals; preoculars 2; postoculars 2–3; temporals 1 + 2.

Size. Both ♂♂ (M.C.Z. 51151–2), 302 (260 + 42) mm.; largest ♀ (M.C.Z. 51153), 380 (330 + 50) mm.

Diet. A sedge frog (*Hyperolius p. puncticulatus*) in one; *Arthroleptis s. whytii* in another; the hind half of a *Phrynobatrachus u. ukingensis* in a third.

Habitat. At 9.30 A.M. I took one as it was basking on the trunk of a fallen tree lying in a swamp fringing the forest; two others were near the base of wild bananas in a forest-edge ravine.

Hemirhagerrhis nototaenia nototaenia (Günther)

Coronella nototaenia Günther, 1864b, Proc. Zool. Soc. London, p. 309, pl. xxvi, fig. 1: Rios de Sena, Zambezi River, Mozambique.

Amphiophis nototaenia Boulenger, 1891a, p. 307.

Amplorhinus nototaenia Boulenger, 1896d, p. 125; 1897e, p. 801; Johnston, 1898, p. 361a.

♀ (M.C.Z. 8979) "Nyika Plateau." (Exch. Brit. Mus.) 1913.

Records. Cape Maclear, Lake Nyasa (B); Fort Hill (B); "Nyika Plateau" (B). We may be reasonably certain that this low country

snake never came from the Nyika Plateau. It is one of the few species I failed to secure during my visit because most of my time was spent above 5,000 feet.

Variation. Midbody scale-rows 17; ventrals 174; anals 2; subcaudals 76; upper labials 8, the fourth and fifth entering the orbit; lower labials 9, the first 4 in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 2 + 2.

Size. ♀, 409 (311 + 98) mm.

Rhamphiophis oxyrhynchus rostratus Peters

Rhamphiophis rostratus Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 624: Tete; Mesuril and Quitangonha, Mozambique.

Rhamphiophis oxyrhynchus Boulenger (not Reinhardt), 1896d, p. 147.

9 (M.C.Z. 51165–73) Mtimbuka. 8–25.ii.49.
3 (M.C.Z. 51174–6) near Tete. 14–28.i.49.

Records. Fort Johnston (B); also Monkey Bay, to judge from a description furnished me by Rodney Wood, Esq.

Native name of the Eastern Beaked Snake. *Kasunjumere* (Yao).

Variation. Midbody scale-rows 17; ventrals 159–178; anals 2; subcaudals 87–101; upper labials 7–9, the fifth, rarely the fourth, entering the orbit (prevented by transverse division of fifth labial on the right side of M.C.Z. 51174); lower labials 10–12, the first 4 or 5 in contact with the anterior sublinguals; preoculars 3; postoculars 2; temporals 2 + 2, 2 + 3, 2 + 4 or 3 + 3.

Size. Largest snake, a topotype (M.C.Z. 51174), 1472 (1065 + 407) mm. Either all are ♀♀, or the hemipenes are so inconspicuous in this species as to make sexing difficult. Only two specimens are of large size, the rest are under 548 mm.

Diet. At Mtimbuka one held a young *Nucras i. ornata*, another the tail of a skink (*Mabuya* sp.) whose owner had escaped.

Habitat. I captured one beneath the thatch of a collapsed hut in the middle of a village.

Psammophylax tritaeniatus tritaeniatus (Günther)

Rhagerrhis tritaeniatus Günther, 1868a, Ann. Mag. Nat. Hist. (4), **1**, p. 423, pl. xix, fig. 8: Southeast Africa.

Trimerorhinus tritaeniatus Boulenger, 1896d, p. 139; 1897e (part), p. 801; Johnston, 1898, p. 361a.

Cerastes tritaeniatus tritaeniatus Bogert (part), 1940, p. 70 (Karonga only).

♂ ♀ (A.M.N.H. 67770–1) Kasungu. 19–23.viii.46.
♂ (A.M.N.H. 67751) Nchisi Mtn. 23.vii–13.ix.46.
2 ♀ ♀ (M.C.Z. 51177–8) Nchisi Mtn. 27.xi.48.

Records. Chiradzulu[1] (B); Chiromo (Mitchell ms.); Chitala River (Mitchell ms.); Fort Hill (B); Karonga (Bogert); Karonga to Kondowe (B); Zomba[1] (B).

Native name of the White-bellied Grass-Snake. *Msalulu* (Chewa and Ngoni).

Variation. Midbody scale-rows 17; ventrals 156–160; anals 2; subcaudals 54–60; upper labials 8, the fourth and fifth entering the orbit; lower labials 9–11, the first 4 or 5 in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 2 + 3, rarely 2 + 2 or 2 + 4.

Color in life. ♀ (M.C.Z. 51177). Above, crown of head, back and tail deep brown, the lower half of the outermost dorsal scale-row pale brown; immediately below this on the flank is a broad, black, lateral band 2½ scales in width, still lower the last 2 (anteriorly) to 2½ (rest of body) scale-rows are pale lemon yellow, the lowest row faintly streaked with orange as far back as the anus. Below, china white, uniform.

Size. Larger ♂ (A.M.N.H. 67770), 600 (487 + 113) mm.; largest ♀ (M.C.Z. 51177), 746 (600 + 146) mm.

Remarks. Strictly speaking *Cerastes* Laurenti is the correct name to apply to members of this genus through the regrettable action of Ferjérváry (1923) designating *Coluber rhombeatus* Linné as genotype, (*vide* Mertens, 1937, Copeia, p. 70). In both medical and popular works, however, *Cerastes* has been too long associated with certain vipers to make such a change rational. It is a case where the powers of the International Commission on Zoological Nomenclature should be invoked to set it aside.

Boulenger (1896d) attributed *Psammophylax* to Günther (1858) whereas it dates from Fitzinger (1843), so takes precedence over *Trimerorhinus* of A. Smith (1847). Boulenger's attempt to distinguish *tritaeniatus* from *variabilis* on characters that are now known to be common to both reptiles, resulted in his confusing the two forms. Owing to their being inseparable by scale counts, I relegated *variabilis* to the synonymy of *tritaeniatus* in 1932. Since when I have consistently misapplied the name *tritaeniatus* to the gray-bellied, montane

[1] Bellies white in all 1 + 7 snakes (*fide* J. C. Battersby in letter: 17.v.51).

race described by Günther from the Shire Highlands.

Consequently, when the two, handsomely colored, white-bellied snakes were brought up the mountain to me at Nchisi, I immediately recognized that they represented a species of snake with which I was quite unfamiliar. Indeed, at first I though they might represent an undescribed form of *Psammophis*. Shortly afterwards I received a letter from C. J. P. Ionides, Esq., of Liwale, Tanganyika Territory, saying that specimens of a snake he had taken at relatively low altitudes there, had been identified as *t. tritaeniatus*. At my request he very kindly sent me a dozen specimens and they are all white-bellied in sharp contrast to *t. variabilis*.

Psammophylax tritaeniatus variabilis Günther

Psammophylax variabilis Günther, 1893 (1892), Proc. Zool. Soc. London, p. 557, pl. xxxv: Shire Highlands, Nyasaland. Günther, 1894a (1893), p. 619; Bocage, 1896a, p. 103; Johnston, 1897, p. 362; 1898, p. 361a.

Trimerorhinus variabilis Boulenger, 1896d, p. 140; 1915c, p. 629.

Trimerorhinus tritaeniatus Boulenger (part: not of Günther, 1868), 1897e, p. 801 (Nyika Plateau only).

1 ♂, 1 ♀ (A.M.N.H. 67742–3) Zomba Plateau. 27.v–11.vi.46.
1 ♂, 1 ♀ (A.M.N.H. 67781–2) Mlanje Plateau. 24.vi–18.vii.46.
3 ♀♀ (M.C.Z. 51179–81) Nyika Plateau. 4–17.xi.48.
1 ♂, 2 ♀♀ (M.C.Z. 51182–4) Zomba Plateau. 6–9.ix.48.
2 ♂♂, 4 ♀♀ (M.C.Z. 51185–90) Mlanje Plateau. 9–10.viii.48.

Records. Nyika Plateau, 6000–7000 feet (B); Shire Highlands (= Mlanje and Zomba. G); Zomba (B).

Variation. Midbody scale-rows 17; ventrals 152–161; anals 2; subcaudals 50–60; upper labials 8, the fourth and fifth entering the orbit; lower labials 9–11, the first 5 in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 1 + 2 or 1 + 3, in two snakes a small corner of the large anterior temporal is split off on one side only.

Color. This species is well-named *variabilis*. Of four I dug from their hibernating hole, one ♀ was vividly striped, two ♀♀ were olive, while the only ♂ was blackish above and below (cf. Günther's colored plate).

Size. Largest ♂ (M.C.Z. 51185), 835 (686 + 149) mm.; largest ♀ (A.M.N.H. 67743), 658 (545 + 113) mm.; smallest specimen (M.C.Z. 51184), 285 (230 + 55) mm.

Remarks. The name *P. t. variabilis* should be applied to all the montane snakes which I have been miscalling *P. t. tritaeniatus* since 1932. Temporal formulae and ventral coloring serve to separate the two races.

Breeding.

On August 10, on Lichenya Plateau, a ♀ held 8 eggs *ca.* 20 x 10 mm.
" 10 " " " " " " 9 " " 23 x 10 mm.
On November 17, on Nyika Plateau an adult ♀ held no developing ova.

Diet. A mouse (*Lophuromys a. aquilus*) was present in one Zomba snake, gray rodent fur in a Mlanje reptile; a skink (*Mabuya b. mlanjensis*) in another, while the stomach of a Nyika snake held the undigested tail of a *M. r. nyikae* together with a small toad (*Bufo t. nyikae*); the juvenile Zomba reptile had swallowed a sedge frog (*Hyperolius* sp.).

Parasites. Cestodes were numerous in the viscera of one Nyika snake.

Hibernation. In Nyasaland, July is the coldest month of the year and few reptiles were abroad on the Lichenya Plateau in August. All six snakes obtained on Mlanje were dug from one or other of two rodent burrows outside which the snakes were sunning. One hole was situated between two boulders, the other at the base of a *Protea* bush; both were shallow.

Habitat. Somewhat to my surprise I found one of these snakes basking along a horizontal fence post on Zomba Plateau.

Dromophis lineatus (Duméril & Bibron)

Dryophylax lineatus Duméril & Bibron, 1854, Erpét. Gén., **7**, p. 1124: White Nile, Anglo-Egyptian Sudan.

Dromophis lineatus Boulenger, 1897, p. 801; Johnston, 1898, p. 361a. Loveridge 1940c, p. 7 (generic revision).

Records. Karonga to Kondowe (B); "Nyika Plateau," (B. in error). That Whyte obtained this lowland form on the Nyika is utterly improbable. I have taken it at Mwaya, just north of Karonga, on the lakeshore littoral on a previous safari but failed to find it in Nyasaland, which is the southeasterly limit of its range. This species is likely to be mistaken for *Psammophis s. sibilans* which it resembles in external appearance, but differs from it in dentition.

Psammophis sibilans sibilans (Linné)

Coluber sibilans Linné (part), 1758, Syst. Nat., ed. 10, **1**, p. 222: "Asia." The type locality is hereby restricted to Egypt, by subsequent designation (A.I.).

Psammophis brevirostris Peters (part), 1881b, Sitzb. Ges. Naturf. Freunde Berlin, p. 89: Xa Matlale, Mozambique.

Psammophis sibilans var. *mossambica* Peters, 1882a, Reise nach Mossambique, **3**, p. 122: Mozambique Island, Mozambique.

Psammophis sibilans var. *tettensis* Peters, 1882a, Reise nach Mossambique **3**, p. 122: Tete (restricted) and Mozambique Island, Mozambique.

Psammophis sibilans Günther, 1894a (1893), p. 618; Boulenger, 1896d, p. 161; 1897e, p. 801; Johnston (inc. var. *intermedia* Fischer), 1897, p. 362; 1898, p. 361a.

Psammophis sibilans sibilans Loveridge, 1940c, pp. 30–41 (revision); Bogert, 1940, p. 79, figs. 14 & 15H.

♀ (A.M.N.H. 67774) Kasungu. 19–23.viii.46.
2 ♂♂ (A.M.N.H. 67749–50) Nchisi Mtn. 27.iii–13.ix.46.
♂ (A.M.N.H. 67759) Likabula River. 19.vi–18.vii.46.
2 ♀♀ (M.C.Z. 51191–2) Nchenachena. 20.xi.48.
2 ♀♀ (M.C.Z. 51193–4) Nchisi Mtn. 30.xi.48.
♂ ♀ (M.C.Z. 51195–6) Likabula River. 29.vii.48.
4 juv. (M.C.Z. 51197–200) Mtimbuka. 8–28.ii.49.
skull & 7 (M.C.Z. 51201–7) near Tete. 13–24.i.49.

Records. Chiromo (Mitchell ms.); Cholo (Mitchell ms.); Fort Hill (B); Fort Johnston (G); Karonga to Kondowe (B); Misuku Mtns. (B); Mlanje (Bogert); Nkata Bay to Ruarwe (B); Shire Highlands (G); Zomba (B).

Native names of Hissing Sand-Snake. *Liwui* (Yao); *mui* (Chewa; Ngoni).

Variation. Midbody scale-rows 17; ventrals 160–178; anals 2, rarely 1 (in A.M.N.H. 67750 only); subcaudals 90–105; upper labials 7–8, the fourth and fifth, rarely the third and fourth, entering the orbit; lower labials 9–11, the first 4 or 5 in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 2 + 2 or 2 + 3 (1 + 1 due to fusion with parietal on right side of M.C.Z. 51201).

Size. The tails of all the largest snakes (H. & B. ♂, 990 mm.; ♀, 952 mm.) are truncate; largest perfect ♂ (M.C.Z. 51201), 1314 (910 + 404) mm.; and ♀ (M.C.Z. 51194), 1150 (835 + 315) mm.

Diet. A shrew (*Crocidura* sp.) in a young Nchenachena snake; fur in intestines and bird quills in stomach of an Nchisi reptile; a skink

(*Mabuya v. varia*) at Mtimbuka; frogs (*Rana o. oxyrhynchus* and *Phrynobatrachus perpalmatus*) in two Tete snakes, while a very young one held the limb bone of a frog, besides beetle elytra and a grasshopper.

Parasites. Both Likabula snakes were infested with parasites. These consisted of pentastomids (*Porocephalus* sp., probably *subulifer*) and nematodes (*Abbreviata* sp., probably *varani;* and *Polydelphis* sp., probably *sewelli*).

Habitat. We caught four juvenile examples of this lacustrine species under damp debris left on sandbars by the shrinking Zambezi at the height of the dry season — January 2 and 4, 1949.

Psammophis subtaeniatus sudanensis Werner

Psammophis subtaeniatus var. *sudanensis* Werner, 1919, Denks. Akad. Wiss. Wien, **96**, p. 504: Kadugli, Anglo-Egyptian Sudan (designated).
Psammophis sibilans var. *subtaeniata* Boulenger (not of Peters), 1891a, p. 307.
Psammophis subtaeniatus Boulenger (not of Peters), 1896d, p. 160; 1897e, p. 801; Johnston, 1898, p. 361a.
Psammophis subtaeniatus sudanensis Loveridge, 1940c, pp. 50–55 (revision).

1 (A.M.N.H. 67780) Kasungu. 19–23.viii.46.
2 (A.M.N.H. 67794–5) Kotakota. 9–10.viii.46.
1 (A.M.N.H. 67784) Chibotela. 24.viii–8.ix.46.
1 (A.M.N.H. 67760) Likabula R. 19.vi–18.vii.46.
5 (M.C.Z. 51220–3) Chitala R. 14–18.xii.48.
1 (M.C.Z. 51219) Mtimbuka. 11.ii.49.

Records. Cape Maclear (B); Fort Hill (B); Lake Nyasa (B); Misuku Mtns. (B); Nkata Bay to Ruarwe (B); "Nyika Plateau" (B); Zomba (B).

Native names of the Northern Stripe-bellied Sand-Snake. *Msalula* (Yao).

Variation. Midbody scale-rows 17; ventrals 154–167; anals 2; subcaudals 102–115; upper labials 8, the fourth or fifth entering the orbit; lower labials 9–11, the first 4 in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 2 + 2 or 2 + 3, rarely 1 + 2 (on three sides of two Chitala snakes).

Size. Largest ♂ (M.C.Z. 51220), 1220 (820 + 400) mm.; largest ♀ not exceptional.

Remarks. Small wonder that Boulenger (1891a) once thought this snake but a race of *sibilans* for the two reptiles cannot be distinguished

by lepidosis. I was particularly anxious to secure Nyasaland examples of *subtaeniatus* so as to ascertain whether I had been correct in assigning all Nyasaland material to the northern race at the time (1940c) the genus was revised. That action is fully justified by this additional material. Apparently the Zambezi does serve as a barrier between the two races.

Diet. A multimammate mouse (*Mastomys c. microdon*) in the large Chitala male; a frog (*Arthroleptis s. sudanensis*) in one of the smaller snakes.

Enemies. In the stomach of a Cape File Snake (*Mehelya c. capensis*) was the tail of a *subtaeniatus* whose owner had obviously wriggled free. Of the snakes listed above, half-a-dozen have lost the ends of their tails, one, indeed, possesses only a well-healed, post-anal stump.

Habitat. Unlike *sibilans*, this is a snake of the dry savanna, yet I shot a young one as it rested on partly submerged branches in a 20-foot well, up whose brick sides it could scarcely have scaled.

Psammophis subtaeniatus subtaeniatus Peters

Psammophis sibilans var. *subtaeniata* Peters, 1882a, Reise nach Mossambique, 3, p. 121: Boror and Tete, Mozambique.

2 skulls + 13 (M.C.Z. 51208–18) near Tete. 6–22.i.49.

Records. These are topotypes of the typical form characterized by three labials entering the orbit, besides more numerous ventrals and subcaudals. This race is unknown from Nyasaland but should be looked for in the lower Shire Valley.

Native name of the Southern Stripe-bellied Sand-Snake. *Nyamzalumbu* (Nyungwe), but Peters states it is called *njamudsarumbe* at Tete.

Variation. Midbody scale-rows 17; ventrals 164–175; anals 2; subcaudals 117–126; upper labials 9, the fourth, fifth and sixth entering the orbit, *except* for one snake which agrees with the northern form in having only 8, with the fourth and fifth entering, and one side of M.C.Z. 51215 where there are 10, the fifth, sixth and seventh entering; lower labials 9–11, the first 4 or 5 in contact with the anterior sublinguals; preocular 1; postoculars 2, rarely 3 (M.C.Z. 51212 only); temporals 2 + 2 or 2 + 3.

Size. Largest ♂ (M.C.Z. 51210), 1187 (762 + 425) mm.; ♀ (M.C.Z. 51218), 1340+ (885 + 455+) mm., tail-tip missing.

Diet. One held a young *Rattus r. alexandrinus*, another a young monitor (*Varanus n. niloticus*); in a third was a skink (*Mabuya s. ellenbergeri*), while a fourth held the entire tail of a *Mabuya lacertiformis*, the lizard having escaped.

Habitat. This last snake I shot after sunset (i.e. about 6.15 P.M.) as it was prowling among the rocks where these lizards had been basking. Another snake was killed on the tree trunk outside my tent. Yet another, surprised on a gravel-strewn hillside when the temperature was about 90°, sought refuge in a hole from which we dug it.

Psammophis angolensis (Bocage)

Amphiophis angolensis Bocage, 1872, Jorn. Sci. Lisboa, **4**, p. 82: Donda, i.e. Dondo, Loanda, Angola. Bocage, 1896a, p. 103.

Psammophis angolensis Boulenger, 1891a, p. 307; 1896d, p. 170; 1897c, p. 801; Johnston, 1898, p. 361a; Sternfeld, 1910a, p. 31; Loveridge, 1940c, pp. 68–69 (revision).

♀ (A.M.N.H. 67772) Kasungu. 19–23.viii.46.

Records. Cape Maclear (B); Fort Hill (B); Fort Johnston (B); Lake Nyasa (S).

Variation. Midbody scale-rows 11; ventrals 149; anals 2; subcaudals 67; upper labials 8, the fourth and fifth entering the orbit; lower labials 7, the first 4 in contact with the anterior sublinguals; preocular 1; postoculars 2; temporals 1 + 2.

Size. Length of ♀, 400 (293 + 107) mm.

Thelotornis kirtlandii oatesii Günther

Dryiophis Oatesii Günther, 1881b, in Oates, Matabeleland and the Victoria Falls, App., p. 330, col. pl. D: Matabeleland, Southern Rhodesia (*fide* Boulenger). 1894a (1893), p. 618; Johnston, 1897, p. 362; 1898, p. 361a.

3 ♂♂ (A.M.N.H. 67776–8) Kasungu. 19–23.viii.46.
1 ♂, 5 ♀♀ (M.C.Z. 51230–5) Mtimbuka. 7.ii–4.iii.49.

Record. Fort Johnston (G).

Native name of Central African Vine-Snake. *Nalikukuti* (Yao).

Variation. Midbody scale-rows 19; ventrals 164–176; anals 2; subcaudals 140–146; upper labials 7–8, the fourth and fifth, rarely fourth only (right side of M.C.Z. 51234) entering the orbit; lower labials 9–12, the first 3–5 (3 on left side of A.M.N.H. 67778) in contact with the

anterior sublinguals; preocular 1; postoculars 2–3; temporals 1 + 2.

Color in life. Of a ♂ juv. (M.C.Z. 51230) as it differs strikingly from that of the adults. Above, crown whitish, *very* faintly tinged with soft green; on posterior part of frontal and between parietals are dusky marks with darker centers; loreal region also flecked with darker and the pale brown temporals edged with black; rostral, upper and lower labials pure white except for an oblique series of greenish dots across the sixth upper labial to the lower postocular and eye; eye cream-colored except for the lower part beside and below the pupil, which is greenish; back and tail vinous.

Size. Largest ♂ (A.M.N.H. 67778), 1343+ (880 + 463+) mm.; largest ♀ (M.C.Z. 51234), 1400+ (910 + 490+) mm.; juv. ♂ (M.C.Z. 51230), 457 (295 + 162) mm.

Remarks. In my (1944q, p. 154) revision of *Thelotornis,* I followed Boulenger (1896d, p. 185) in considering *oatesii* synonymous with *capensis.* Perhaps it may yet prove too ill-defined to be recognizable. In Nyasaland, however, I found the big vine-snake inhabiting the lowland savanna could be distinguished at a glance from its montane forest representative. Where deforestation has taken place recently, these habitat differences may not hold good, for on a former expedition I found the forest type plentiful at Mwaya, in low-level country on Nyasa's northwest shore.

While the speckled-headed form is unquestionably *T. k. capensis* of Smith, the lowland form (*oatesii*) is in several respects intermediate between *capensis* and the spotless-headed *kirtlandii* of West Africa. In the type of *oatesii* the speckling on the head is reduced to a few large spots arranged in a Y-shaped marking whose stem lies along the interparietal suture and its arms extend across the posterior portion of the frontal to the supraoculars. Except that the spots are even more coalesced than in Günther's figure, this is the pattern common to all the adults listed above and is indicated in the juvenile whose coloring has been described. The Nyasaland material all shows the striking black chain-like marking across the temporal region figured by Günther. I have no other material of *oatesii* but am inclined to think that in this latitude it extends right across the continent to Angola. This is suggested by the high ventral counts of Angolan snakes, and Bocage's (1895a, p. 119) recognition of two forms when he separated off the eastern, speckled-headed snakes as *mossambicana,* a synonym of *capensis* Smith.

Contrasting data of this Nyasaland material

Subspecies	*Ventrals*	*Subcaudals*	*Largest* ♂	*Largest* ♀	*Head marks*
k. capensis	149–164	126–145	1250 mm.	1215 mm.	a Y
k. oatesii	164–176	140–146	1343+mm.	1400+mm.	speckled

Diet. A skink (*Mabuya v. varia*) in one, a frog (*Phrynobatrachus perpalmatus*) in another.

Habits. Relying on her protective coloring, one large vine-snake allowed me to take hold of her neck with my forceps as she rested entwined in a tall bush, growing at the base of a baobab almost on the lake shore.

Thelotornis kirtlandii capensis Smith

Thelotornis capensis A. Smith, 1849, Ill. Zool. S. Africa, **3**, App., p. 19: "Kaffirland and the country towards Port Natal," i.e. Durban.

Thelotornis kirtlandii Boulenger, 1891a, p. 307: 1896d, p. 185; 1897e, p. 801; Johnston, 1898, p. 361a; Sternfeld, 1910a, p. 31.

Thelotornis kirtlandii capensis Loveridge (part), 1944q, pp. 154–159 (revision).

2 ♀♀ (A.M.N.H. 67757–8) Likabula R. 19.vi–18.vii.46.
5 ♂♂, 5 ♀♀ (M.C.Z. 51224–9) Misuku Mtns. 2–16.x.48.
♂ (M.C.Z. 51250) Chowe, Mangoche. 12.ii.49.
10 ♂♂, 13 ♀♀ (M.C.Z. 51240–9) Cholo Mtn. 11–25.iii.49.
2 ♂♂, 2 ♀♀ (M.C.Z. 51236–9) Likabula R. 30.vii–3.viii.48.

Records. The preceding synonymy and following records (except the material from Mlanje and Zomba which I have seen) must be regarded as purely tentative pending an examination of all the material in the British Museum. The scale counts of these Zomba snakes as recorded by Boulenger (1896d, p. 186) were often erroneous, especially as regards subcaudals; the amended counts are included in the key on p. 320.

Lake Nyasa (B:S); Mandala (B); Mlanje (B); "Nyika Plateau" (B); Shire Highlands (G); Zomba (B).

Native names of Cape Vine-Snake. *Lukomo* (Misuku); *nalikukuti* (Manganja and Nyanja).

Variation. Midbody scale-rows 19 (but only a few counted); ventrals 148–164; anals 2; subcaudals 126–145; upper labials 8–9; the fourth and fifth, rarely the third, fourth and fifth (two sides), or fifth and sixth (two sides) entering the orbit; lower labials 9–12, the first 4 or 5 in contact with the anterior sublinguals; preocular 1; post-

oculars 2–4, usually 3; temporals 1 + 2, rarely 1 + 1 (one side), 1 + 3 (one side), or 2 + 2 (one side).

Size. Largest ♂ (M.C.Z. 51248), 1250 (765 + 485) mm.; largest ♀ (M.C.Z. 51238), 1215 (785 + 430) mm.

Color. Typically, as in Matipa snakes, the entire top of the head is flecked with black, but among Cholo snakes there is a marked tendency towards restrictions of these markings to the crown, some even foreshadowing the Y-shaped pattern of *oatesii*, but not the characteristic black temporal chain of that form. Tongues scarlet with black tips.

Breeding. No sign of breeding among the many ♀ ♀ taken in March, but on October 8, in Matipa Forest, a ♀ held 8 eggs about 32 x 17 mm., and on the same date and place another with 8 eggs about 35 x 14 mm. These latter appeared quite ready for laying.

Diet. Five had eaten chameleons (2 gravid ♀ ♀ *Brookesia nchisiensis;* 3 *Chamaeleo d. dilepis*); the Chowe snake held the spinous tail of a zonure (*Cordylus c. tropidosternum*); at Cholo one had eaten a gecko (*Lygodactylus a. angularis*), another a skink (*Mabuya r. varia*), two held green snakes (*Philothamnus i. irregularis*), four had swallowed sharp-nosed frogs (*Rana o. gribinguiensis*) and three pugnosed frogs (*Breviceps mossambicus*). In the same stomach with one *Breviceps* was a mass of very large and fat, winged termites, whose fresh condition made it appear unlikely they had been spued up by the frog or liberated by the gastric juices — for only the hind limbs of the amphibian remained undigested. Only one vine-snake held the remains of a bird, and as my previous records also indicate that cold-blooded creatures constitute the principal prey of this species, I think it would be advisable to abandon the alternative name of "Bird Snake."

Temperament. A two-and-a-half foot vine-snake came in under the awning extension of my tent as I was seated at the table in front of the tent proper. The reptile "froze" as I rose to meet it, and, relying on its cryptic coloring, permitted me to pass within two feet of its head as it lay fully extended. Turning, I picked it up by the tail (13.iii.49).

As I was returning to my tent I came on a vine-snake resting motionless in a bush, its head and tail concealed among the foliage. I seized what I supposed was the posterior third, but vine-snakes taper in both directions and I had actually grasped the reptile four inches behind the head. Gaping widely, the snake struck at my thumb, causing the knuckle to bleed but without any symptoms of poisoning (17.iii.49).

Dispholidus typus (Smith)

Bucephalus typus A. Smith, 1829, Zool. Journ., **4**, p. 441: Old Latakoo, South Africa.

Dispholidus typus Boulenger, 1896d, p. 187; 1897e, p. 801; Johnston, 1898, p. 361a; Bogert, 1940, p. 68; Mitchell, 1946, p. 42.

♀ (A.M.N.H. 67775) Kasungu. 19–23.viii.46.
♂ (A.M.N.H. 67785) Chibotela. 28.viii–18.ix.46
♂ (M.C.Z. 51551) Misuku Mtns. 2.x.48.
♂ (M.C.Z. 51552) Nchenachena. 26.x.48.
♀ (M.C.Z. 51553) Mzimba. 23.xi.48.
4 ♂♂, 1 ♀ (M.C.Z. 51554–8) Nchisi Mtn. 8–10.xii.48.
♀ (M.C.Z. 51559) Chitala River. 17.xii.48.
♀ (M.C.Z. 51560) Mtimbuka. 11.ii.49.
♀ (M.C.Z. 51561) Cholo Mtn. 11.iii.49.
♀ (M.C.Z. 51562) Boroma Mission, M. 25.i.49.

Records. Mzimba (Bogert); "Nyika Plateau" (B); Zomba (B). Seen at Blantyre, Chiromo and Port Herald by Mitchell.

Native names of the Boomslang. *Kweza* (for green ♂: Chewa); *muu* (for brown ♀: Chewa); *miyalalwe* (Misuku); *sanga* (Nyanja). Often confused with the Black Mamba, *vide infra.*

Variation. Midbody scale-rows 19; ventrals 174–194; anals 2; subcaudals 104–123; upper labials 7, the third and fourth, rarely third only (M.C.Z. 51558 only) entering the orbit; lower labials 8–12, the first 4 in contact with the anterior sublinguals; preocular 1; postoculars 3; temporals 1 + 2, rarely 1 + 1 (M.C.Z. 51559 only), while there is the appearance of 2 + 2 (on both sides of M.C.Z. 51561) owing to a piece of the parietal being split off.

Size. Largest ♂ (M.C.Z. 51557), 1570 (1175 + 395) mm.; largest ♀ (M.C.Z. 51560), 1542 (1122 + 420) mm.

Color. This is strikingly different in the two sexes in Nyasaland, but does not necessarily hold elsewhere in Africa. The ♂♂ — with the exception of the halfgrown (845 mm.) Chibotela snake — were vivid green. The ♀♀ ranged from pinkish brown to drab brown. Of the latter hue was the Mtimbuka ♀, brought to me within half-an-hour of a big mamba of the same shade and size. Small wonder that the natives confuse the two species and for boomslangs furnished me with the name of the mamba both at Mtimbuka (*mbobo:* Yao) and at Boroma near Tete (*nyakungu:* Nyungwe).

In life. Mzimba ♀. Above, pinkish brown; lips, and chin white;

sides of throat streaked with yellow; flanks whitish finely flecked with reddish brown and each alternate scale of the lowest series exhibiting a gray-black dash. Below, white, heavily flecked with reddish brown so as to produce an exceptionally beautiful pinkish appearance.

In life. Nchisi ♀. Above, uniform "mamba" brown; lips, chin, throat, and anterior fifth of body slightly greenish white; rest of undersurface plumbeous. The Chitala, Mtimbuka, Cholo and Boroma snakes were all of this type as noted down at the time.

Sexual dimorphism. If present, it will only be average, for 7 ♂♂ show a ventral range of 174–194, their subcaudals 111–123; 7 ♀♀ show a ventral range of 183–194, their subcaudals 104–123.

Breeding. About August 19–23, at Kasungu, a ♀ held 14 eggs measuring *ca.* 40 x 16 mm. No other ♀♀ were gravid.

Diet. Two chameleons (*Chamaeleo d. dilepis* and *C. d. petersi*) were dying of boomslang venom when their attackers were captured. A further five chameleons, all very large *dilepis*, were recovered from the stomachs of as many snakes.

Enemies. The Nchisi series were taken from acacia trees just below the Boma, from whose veranda we watched two Chewa youths hunting them. They shot the snakes very neatly with arrows, and three males were obtained in this way by one lad on December 10.

Calamelaps unicolor polylepis Bocage

Calamelaps polylepis Bocage, 1873b, Jorn. Sci. Lisboa, **4**, p. 216: Dondo, Angola. Boulenger, 1896d, p. 246; Sternfeld, 1910a, p. 32, fig. 36.
Calamelaps miolepis Günther, 1888b, Ann. Mag. Nat. Hist. (6), **1**, p. 323: Cape Maclear, Lake Nyasa, Nyasaland.
Calamelaps unicolor polylepis Loveridge, 1944q, p. 162 (revision).

Records. Cape Maclear, at the southern end of Lake Nyasa, is the site of the *original* Livingstonia Mission.

Remarks. The Angolan Purple-glossed Snake is distinguished from the following form only by its possession of 21 midbody scale-rows. Nyasaland is in the general region where three forms meet and I was disappointed in failing to obtain a series of this burrowing snake that so closely resembles the burrowing adders.

Calamelaps unicolor warreni Boulenger

Calamelaps warreni Boulenger, 1908b, Ann. Natal Mus., **1**, pp. 230, 234, fig. 3: Kosi Bay, Zululand.

♂ (M.C.Z. 51563) near Tete. 14.i.49.

Variation. Midbody scale-rows 19; ventrals 184; anals 2; subcaudals 29; upper labials 6, the third and fourth entering the orbit; lower labials 6, the first 3 in contact with the anterior sublinguals; preocular 0; postocular 1; temporal 1.

Size. ♂, 425 (383 + 42) mm.

Remarks. This Eastern Purple-glossed Snake was killed in Kasumbadedza village after a heavy shower. Whether the race can be maintained as distinct from *C. u. polylepis* remains to be seen. In all probability both forms will be found to occur in Nyasaland.

Aparallactus lunulatus lunulatus (Peters)

Uriechis lunulatus Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 323: Tete, Mozambique.

Aparallactus lunulatus Boulenger, 1896d, p. 258; Loveridge, 1944q, p. 195 (revision).

♀ (M.C.Z. 51564) near Tete. 14.i.49.

Records of the Blotched-back Centipede-eater. Lake Nyasa (B).

Variation. Midbody scale-rows 15; ventrals 161; anal 1; subcaudals 50; upper labials 6, the third and fourth entering the orbit; lower labials 7, the first 4 in contact with the anterior sublinguals; preocular 1, in contact with the nasal; postocular 1; temporals 1 + 1.

Size. ♀, 525 (430 + 95) mm., by far the largest example known.

Color. This exceptionally large topotype lacks the greenish tinge of Peters' (1882a, pl. xviii, fig. 2) figure, while the lunar markings on nape, though present, are exceedingly faint. In general, this ♀ is pinkish brown, the margin of each scale edged with black resulting in a reticulated appearance and offering a resemblance to a young *Rhamphiophis o. rostratus.*

Habitat. Hoed up in a native plot close to Kasumbadedza village on the morning after a heavy shower.

Aparallactus ? capensis capensis Smith

Aparallactus capensis A. Smith, 1849, Illus. Zool. S. Africa, Rept., app. p. 16: Kaffirland to the eastward of Cape Colony. Bogert, 1940, p. 43 (Mlanje).

Uriechis capensis Günther, 1893 (1892), p. 555 (Zomba); Johnston, 1897, p. 362.

? *Aparallactus punctatolineatus* Boulenger, 1895h, Ann. Mag. Nat. Hist. (6), **16**, p. 173: Biballa, Angola. Boulenger, 1896d, p. 261 (Chiradzulu).

Aparallactus nigriceps Boulenger (part: not of Peters), 1895h, p. 173; 1896d, p. 260 (Zomba).

Aparallactus capensis capensis Loveridge (part), 1944q, pp. 205–210 (revision: but *omit* Lake Nyasa and Shire Highlands).

♂ (M.C.Z. 51565) Blantyre (B. L. Mitchell). xi.46.

Records. *Vide cit. supra;* add Chitala River from below?

Variation. In my revision of *capensis* I synonymized *punctatolineatus* (which has the second and third labials entering the orbit) assuming that, as it occurs within the range of *capensis* (which differs only in having the third and fourth labials entering) the few known specimens were variants towards *nigriceps* of Tete (a species that is still, after a century, known only from Peters' types and Bianconi's specimen, yet well distinguished by the low ventral (108–123) and subcaudal (20–35) counts).

Whether I was correct remains to be seen in view of the following data:

	Locality	*Labials*	*Ventrals*	*Subcaudals*
Bogert's *capensis*	Mlanje	3rd & 4th	141	47
Boulenger's *punctatolineatus*	Zomba	2nd & 3rd	149	40
Boulenger's "*nigriceps*"	Chiradzulu	"	160	36
M.C.Z. 51565 listed above	Blantyre	"	150	40

If only some Nyasaland resident would take the trouble to collect a score or more of these little snakes, the question might be settled.

Color. Black of the head merged with the six-scale-wide black collar, but two light spots indicate where the light anterior border of the collar would normally be; body and tail rosy pink. Below, uniform white.

Enemies. A partly digested snake with coloring similar to that of the Cape Centipede-eater, was in the stomach of an eagle owl (*Bubo lacteus*) that I shot in a tree overhanging the Chitala River.

Aparallactus guentheri Boulenger

Uriechis capensis Günther (not of Smith), 1888b, p. 324; Boulenger, 1891a, p. 308; Johnston, 1897, p. 362; 1898, p. 361a.

Aparallactus Guentheri Boulenger (part: exclude Angola), 1895h, Ann. Mag. Nat. Hist. (6), **16**, p. 172: Lake Nyasa and Shire Highlands, Nyasaland;

Zanzibar. Boulenger, 1896d, p. 259, pl. xi, fig. 2; Sternfeld, 1910a, p. 36.

Remarks. When preparing my revision of the genus *Aparallactus,* published during the war, I (1944q, pp. 181–213) was unable to obtain information regarding the three cotypes of *guentheri,* which Boulenger separated from *capensis* on the basis of their divided nasals. As division occurs spasmodically among undoubted *capensis,* I relegated *guentheri* (with the exception of the Angolan specimen mentioned by Boulenger, which I assigned to *c. bocagii*) to the synonymy of *c. capensis.*

In this I was mistaken, for though in scale counts *guentheri* agrees absolutely with *c. capensis,* and both species occur in the same locality, there are the distinctions mentioned in the key accompanying this paper (p. 321). Apparently the characteristic jet black or plumbeous coloring of *guentheri* had faded, for Boulenger described it as being "Blackish brown above, a little lighter beneath . . ."

Failing to find this species in Nyasaland, I made the following notes about the cotypes, and some others, on my return journey when passing through London.

		Ventrals	*Caudals*
B.M. 94.10.13.11 renumbered 1946.1.6.81	ex. Zanzibar.	—	—
B.M. 77.7.2.9. " 1946.1.6.88	ex. L. Nyasa.	149	59
B.M. 91.12.31.35 " 1946.1.8.59	ex. Shire Highlands.	162	51
B.M. 96.6.23.3 (not *nigriceps* of Cat.)	ex. Zomba.	151	53
B.M. 1902.2.12.102	Mazoe, Southern Rhodesia.	157	58
B.M. 1902.6.7.9.	Mombasa, Kenya Colony.	156	47

The entire back and tail of this (faded brown) Mombasa snake is vermiculated with white which almost forms a parallel series of white-edged, dark blotches in the middle of the body.

ELAPIDAE

Elapsoidea sundevallii decosteri Boulenger

Elapsoidea Decosteri Boulenger, 1888d, Ann. Mag. Nat. Hist. (6), **2**, p. 141: Delagoa Bay, Mozambique.
Elapsoidea Guentheri Günther (part: not of Bocage), 1895, p. 525.
Elapechis guentheri Boulenger (part: not of Bocage), 1896d, p. 359.
Elapsoidea sundevallii decosteri Loveridge, 1944q, p. 217 (revision).

♂ (A.M.N.H. 67763) Likabula River. 19.vi–18.vii.46.

Records. Shire Highlands (G).

Variation. Midbody scale-rows 13; ventrals 152; anal 1; subcaudals 22; upper labials 7, the third and fourth entering the orbit; preocular 1; postoculars 2; temporals 1 + 2.

Color. Being an adult, this specimen is almost uniformly black, retaining only the faintest trace of a single pair of white crossbands.

Size. Total length 600 (560 + 40) mm.

Naja haje haje (Linné)

Coluber haje Linné, 1758, Syst. Nat., ed. 10, p. 255: Lower Egypt.
Naja haje var. *annulifera* Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 624: west of Tete, Mozambique.
Naja haje Peters, 1882a, p. 137, pl. xx, figs. 7–8.
Naia haie Boulenger, 1891a, p. 308.
Naja haje haje Bogert, 1943, p. 288 (synopsis of races).

♂ (M.C.Z. 51566) west of Tete. 25.i.49.

Records. Shire Valley (B).

Native name of the Egyptian Cobra. *Chidiansana* (Nyungwe), which is very different from "*schibarampamba*," as recorded by Peters.

Variation. Midbody scale-rows 19; ventrals 194; anal 1; subcaudals 53; upper labials 7, sixth largest but none entering orbit; preocular 1; subocular 1 (3 in figured type of *annulifera*); postocular 1; temporals 1 + 2.

Color. Across 13 ventral scales on the neck of this topotype of *annulifera* is a jet black band which is sharply distinct from the otherwise uniformly white underside. To judge from Anderson's (1898, pp. 313–314) remarks, similarly marked specimens of this variable snake occur also in Egypt so that Peters (1882a) was probably correct in regarding his *annulifera* as untenable.

Size. Total length 416 (355 + 61) mm.

Diet. In its stomach was a freshly swallowed frog (*Rana o. oxyrhynchus*) that has been preserved.

Habitat. Under debris left by the shrinking waters of the Zambezi.

Naja nigricollis nigricollis Reinhardt

Naja nigricollis Reinhardt, 1843, Dansk. Vidensk. Selsk. Skrift., **10**, p. 269, pl. iii, figs. 5 & 7: Guinea. Günther, 1894a (1893), p. 618; Johnston, 1897, p. 362; 1898, p. 361a; Mitchell, 1946, pp. 29, 42.

Naja mossambica Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 625: Sena and Tete, Mozambique.

Naia nigricollis Boulenger, 1891a, p. 308; 1896d, p. 378; 1897e, p. 801.

Naja flava Johnston (not of Merrem), 1897, p. 362; 1898, p. 361a; Duff, 1906, p. 137 (spitting cobra).

Naja nigricollis nigricollis Bogert, 1940, p. 87; 1943, pp. 290, 300, figs. map.

Sepedon haemachaetes Shircore (not of Lacépéde), 1947, p. 200.

♂ (A.M.N.H. 67773) Kasungu. 19–23.viii.46.
♀ (A.M.N.H. 67764) Likabula River. 19.vi–18.vii.46.
♂, 4 ♀ ♀ (M.C.Z. 51568–72) Mtimbuka. 17–21.ii.49.
♀ (M.C.Z. 51573) Likabula River. 30.vii.48.
♂ (M.C.Z. 51574) Ruo River. 4.iv.49.
♀ (M.C.Z. 51567) near Tete. 21.i.49.

Records. Chiromo (J; M); Chitala River (M); Cholo (M. & Westrop); Karonga (Bogert); Karonga to Kondowe (B); Monkey Bay (M); Port Herald (M); Shire Valley (B); Zomba (B).

Native names of the Black-necked Cobra. *Liteo* or *litewo* (Yao); *mamba* (Nyanja); *mbadza* (Nyungwe) — this last is very different from the descriptive name "*njamudschidiandsâna*" recorded by Peters.

Variation. Midbody scale-rows 21–25; ventrals 180–204; anal 1; subcaudals 55–62; upper labials 6–7, third largest and entering orbit; preoculars 2; postoculars 3, rarely 2 (on left side only of M.C.Z. 51568); temporals 2 + 3, 2 + 4, 2 + 5, 2 +6, 3 + 4, 3 + 5 and 3 + 6. It appears doubtful whether the name *mossambica*, of which M.C.Z. 51567 is a topotype, can be used in a subspecific sense.

Size. Largest ♂ (A.M.N.H. 67764), 1165 (950 + 215) mm.; largest ♀ (M.C.Z. 51573), 1220 (1025 + 195) mm.

Breeding. On July 30, at Likabula River, this ♀ held 21 eggs measuring about 25 x 10 mm.

Diet. Her stomach held two freshly-swallowed *Bufo r. regularis* and the bones of a third; in another was a frog (*Phrynobatrachus natalensis*)

Parasites. A tick (*Aponomma* sp.) was preserved from the Likabula ♀.

Aestivation. Both this July 30 snake, and a ♂ taken February 17, held large deposits of fat, whereas another ♂ found wandering in the headboy's house on April 4, was lean and its stomach empty.

Habitat. On February 18 I captured a young ♀ beneath the thatch of a collapsed hut; on the 21st two others that were half buried in sandy soil beneath a fallen coconut palm. The Kasumbadedza snake was lying among dead leaves and rocks to one side of a sandy river bed

up which we were walking. When a babbler I shot fell from an overhanging tree to the river bed, a small African boy who was carrying my haversack dashed forward to retrieve the bird. In doing so he almost ran on to the snake which, rising with spread hood, gave him an awful fright. Afridi fled back behind me exclaiming that the reptile was "too big;" actually it was only 15 inches. The snake ejected its venom repeatedly when I went to pick it up.

Venom. The 20-inch spitting cobra that bit the toe of a six-year-old African boy near Fort Johnston, could not have been a "ringhals (*Sepedon haemachates*)" for *Hemachatus haemachatus* does not occur north of the Zambezi. Misled by this erroneous identification, Christensen & Waal (1947, p. 680) utilized true ringhals venom in the series of experiments they devised as a test of the efficacy of the treatment employed in the case of the bitten boy. Their conclusion as to its uselessness, however, is unlikely to have been affected by the difference in composition of the venom.

Naja melanoleuca Hallowell

Naia haie var. *melanoleuca* Hallowell 1857, Proc. Acad. Nat. Sci., Philadelphia, p. 61: Gabon.
Naia melanoleuca Boulenger, 1896d, p. 376.
Naja melanoleuca Mitchell, 1946, pp. 29, 42.

♂ (A.M.N.H. 67755) Likabula River. 19.vi–18.vii.46.
♂ (M.C.Z. 51575) Misuku Mountains. 29.ix.48.

Records. Port Herald (M); Shire Valley (B).

Native names of the Black-and-white-lipped Cobra. *Fumbe* (Misuku); *liteo* (Yao; but not specific); *mamba* (Ngoni and Nyanja; but not specific).

Variation. Midbody scale-rows 19; ventrals 212–214; anal 1; subcaudals 65–67; upper labials 7, sixth largest, third and fourth entering orbit; preocular 1; postoculars 3; temporals 1 + 2 or 1 + 3.

Color. Juv. ♂. Above, head brown; body and tail black. Below, chin, throat, and anterior third of body white crossed by two black bands each eight-ventrals wide; rest of body and tail jet black.

Ad. ♂. Above, head and neck yellow brown; body brown freely flecked with black; tail almost black, lighter on sides. Below, creamy white copiously speckled with black.

Size. Larger ♂ (A.M.N.H. 67755), 1708 (1420 + 288) mm.

Habits. With head concealed in the shoulder-high grass, the smaller cobra was lying stretched across a narrow footpath skirting the Matipa Forest. When Mrs. Loveridge came along she held the reptile down with her snail-collecting hoe. Promptly withdrawing its head from the grass, the snake spread its hood and raised its forepart. Despite this prompter towards a correct identification, my wife was too intent on securing the specimen—which she did with some help from her sister — to think of its being a cobra.

Dendroaspis angusticeps (Smith)

Naia angusticeps A. Smith, 1849, Illus. Zool. S. Africa, Rept., pl. lxx: Natal.
Dendraspis angusticeps ? Johnston, 1897, p. 362; 1898, p. 361a; Mitchell, 1946, pp. 28, 42.
Dendroaspis angusticeps Loveridge, 1950a, p. 3.

2 ♂♂, 1 ♀ (M.C.Z. 51576–8) Cholo Mtn. 14–20.iii.49.

Records. Chiromo (*fide* Mitchell ms. — though possibly a "Black" Mamba, with which this species has long been confused); Mzimba (Loveridge — specimen in Brit. Mus. det. H. W. Parker).

Native names of the Green Mamba. *Songo* (*kasongo* is diminutive: Manganja).

Variation. Midbody scale-rows 19; ventrals 209–216; anals 2; subcaudals 107–116 (tail-tip possibly missing for 107); upper labials 8, the fourth entering orbit; preoculars 2–3; postoculars 3–4; temporals 2 + 2 or 2 + 3.

Size. Larger ♂ (M.C.Z. 51576), 1804 (1400 + 404) mm. when killed; the body contracted 70 mm. in alcohol.

Habitat. This 71-inch mamba was killed in a hut, which it had presumably entered in search of rodents, for its stomach was empty.

Folklore. During my many visits to the forest capping Cholo Mountain, accompanied by two old men, selected as guides because of their familiarity with the forest, we frequently found the fallen fruits (allegedly poisonous to human beings) of the *mbobo* tree (*mbobobo* is the name usually applied to the larger mamba *D. polylepis*). These fruits, rather like oval avocado pears, were lying on the ground with their contents removed through a long narrow opening. The guides asserted that it is a *songo* snake that does this, and were unconvinced when I pointed out the impossibility and suggested that it was more likely to have been done by a rodent such as the little squirrel (*Parax-*

erus cepapi sindi) of which we saw a few in the forest canopy. The old men also said that native medicine men procure a medicine from the roots of the *mbobo* tree.

Dendroaspis polylepis polylepis (Günther)

Dendraspis polylepis Günther, 1864, Proc. Zool. Soc. London, p. 310: Zambezi River, Mozambique.
Dendrastis (*sic*) *angusticeps* Duff (not of Smith), 1906, p. 138.
Dendroaspis polylepis Loveridge, 1950a, p. 3.

♀ (M.C.Z. 51579) Mtimbuka. 11.ii.49.

Records. Karonga (*fide* Mitchell, who writes on 14.i.50 that he and his boys killed, but failed to preserve, a "nine-foot black mamba" they found high in a leafless tree); Murchison Cataracts (for Duff's description of a "crowing crested cobra" more properly belongs to this species); Mzimba (Loveridge's record of a specimen in the British Museum, det. H. W. Parker. It will be noted that two species of mamba occur at Mzimba, and the long confusion of the two is in part due to the frequency with which both kinds are found in the same locality).

Native name of the Black Mamba. *Songo* (as for *angusticeps*); *songwe* (Yao at Mtimbuka).

Variation. Midbody scale-rows 23; ventrals 261; anals 2; subcaudals 119; upper labials 8, the fourth entering orbit; preoculars 3; postoculars 4; temporals 2 + 3.

Color. This ♀ was a greyish brown (I have never yet seen a black mamba) of precisely the same shade as a boomslang (*Dispholidus typus*) brought in the same day. Small wonder that the natives fail to distinguish between these two tree snakes.

Size. Total length of ♀, 1557 (1230 + 327) mm.

Temperament. In the vicinity of Mount Hora, a rocky hill lying to the left of the main road running north from Mzimba, mambas appear to be particularly troublesome. Major D. N. Smalley, when Agricultural Officer for the Northern Province, told me that one, which was lying across the road, reared up as his car approached and struck the windscreen a resounding thwack. Mr. S. E. Illingworth, Assistant District Commissioner at Mzimba, had a similar experience except that the snake struck the door of the open touring car in which he and his family were driving. I heard of a third authentic case whose details I cannot now recall.

Replying to a query from me, Mr. W. J. Rangeley, then acting Provincial Commissioner stationed at Mzimba, wrote saying that the snake "I assume to be a Black Mamba is fairly common in this district. Its colour is a deep brownish black and its average length seems to be about eight to ten feet. When surprised it rears up about chest high. Bus drivers stop if they see one on the road for fear it may strike a passenger. These snakes are most commonly found in the rocky hills where I assume they feed on squirrels and rock rabbits." (ex. letter of 28.iii.49).

As at Mzimba, it seems probable that both species of mamba occur at Nchisi. Mr. Guy Muldoon, who lives nearby and frequently hunts on the mountain, tells me that once — but once only — he encountered a mamba which suddenly reared chest-high in front of him. He shot it with the .22 rifle he was carrying, and found the snake measured eight and a half feet.

One afternoon when we were at Nchisi, my headman Thomas, who had run back to the house for a bushknife he had forgotten, was hurrying after me when he encountered a big snake that came sliding down the eroded, rock-strewn hillside and out on to the footpath within six feet of him. The startled snake reared up (allegedly higher than Thomas' face, a statement that may be discounted) and faced him for a few seconds, then, dropping to the ground, it continued on downhill to a bush-choked ravine. In reply to my query Thomas was certain it spread no hood.

VIPERIDAE

Atractaspis bibronii rostrata Günther

Atractaspis rostrata Günther, 1868a, Ann. Mag. Nat. Hist. (4), **1**, p. 429, pl. xix, fig. 1: Zanzibar. Boulenger, 1891a, p. 308; 1896d, p. 514; Sternfeld, 1910a, p. 44, fig. 53.

Atractaspis bibronii Bogert (not of Smith), 1940, p. 106.

Records. Lake Nyasa (B); Mlanje Mountain (Bogert).

Remarks. I failed to obtain a specimen of the Zanzibar Burrowing Adder in Nyasaland, but take this opportunity of saying that data of specimens from south of the Zambezi supplied me by Dr. V. Fitz-Simons show that a preponderance of snakes possess 21 midbody scale-rows. For these the name *A. b. bibronii* A. Smith is available. Dr. Laurent (1945. Revue Zool. Bot. Afr., **38**, p. 338) was correct in reviving the name *rostrata* for East African examples of this snake, the majority of them having 23 or 25 midbody scale-rows.

Causus rhombeatus (Lichtenstein)

Sepedon rhombeatus Lichtenstein, 1823, Verz. Doubl. Mus. Berlin, p. 106: No locality.

Causus rhombeatus Boulenger, 1891a, p. 308; Günther, 1894a, (1893), p. 618; Boulenger, 1896d, p. 467; 1897e, p. 801; Johnston, 1897, p. 362; 1898, p. 361a; Bogert, 1940, p. 96; Mitchell, 1946, p. 42.

♀ (A.M.N.H. 67796) Zomba Plateau. 27.v–11.vi.46.
♀ (A.M.N.H. 67761) Likabula R. 19.vi–18.vii.46.
♀ (A.M.N.H. 67791) Cholo Mtn. 18.ix.–1.x.46.
♀ (M.C.Z. 51580) Chinunkha. 18.x.48.
♂, 3 ♀♀ (M.C.Z. 51581–4) Misuku Mtns. 27.ix.–5.x.48.
♂ (M.C.Z. 51585) Nchenachena. 25.x.48.
4 ♀♀ (M.C.Z. 51586–9) Cholo Mtn. 11–18.iii.49.
2 ♀♀ (M.C.Z. 51590–1) Likabula R. 2.viii.48.
♂ ♀ (M.C.Z. 51592–3) Ruo R., Mlanje Mtn. 2.iv.49.

Records. Blantyre Mission (B); Chitala River (M); Fort Johnston (J); Karonga (Bogert); Mandala, Blantyre (B); Mlanje Mtn. (Bogert); "Nyika Plateau" (B); Shire Highlands (G); Zomba (B).

Natives names of the Common Night Adder. *Kalelea* (Yao); *kasambwe* (Nyanja but generic); *luwando* (Misuku).

Variation. Midbody scale-rows 17–19; ventrals 138–146; anal 1; subcaudals 21–33 (extremes checked); upper labials 6, excluded from orbit; preoculars 1–2; suboculars 1–2; postoculars 1–2; temporals 2 + 3, rarely 2 + 2 or 2 + 4.

Color. While young snakes from Cholo Mountain had well-defined dorsal rhombs, an adult ♀ from the same locality is ashy drab with only a faint trace of markings; similar conditions prevail on nearby Mlanje. The normal black lateral streaks on the belly of this species, had spread extensively over the ventrals of the exceptionally big ♀ from the Misuku Mountains.

Size. Largest ♂ (M.C.Z. 51584), 527 (470 + 57) mm.; largest ♀ (M.C.Z. 51581), 846 (740 + 106) mm.; smallest ♀ (M.C.Z. 51587), 185 (170 + 15) mm. on March 3rd.

Breeding. On August 2, at Likabula, a ♀ held 26 eggs *ca.* 25 x 14 mm. On October 5, on Misuku Mountains, a ♀ held 22 eggs *ca.* 14 x 6 mm.

Diet. Toads (*Bufo r. regularis*) in the stomachs of Nchenachena and Likabula snakes; a frog (*Leptopelis bocagii*) in a Cholo adder.

Parasites. Ascarid worms (*Ophidascaris, Polydelphis,* and *Hexametra* spp.) in the alimentary tracts of night adders taken in the Misuku Mountains and at Likabula River.

Causus defilippii (Jan)
Plate 5, figure 2

Heterodon De Filippii Jan, 1862, Zool. Anat. Fisiol., **2**, p. 225: Africa.
Causus (*Heterophis*) *rostratus* Günther, 1863e, Ann. Mag. Nat. Hist. (3), **12**, p. 363: Ugogo, Tanganyika Territory.
Causus rostratus Günther, 1893 (1892), p. 555; Johnston, 1897, p. 362; 1898, p. 361a.
Causus defilippii Boulenger, 1896d, p. 469; Bogert, 1940, p. 99.

♂ (M.C.Z. 51594) Nchenachena. 22.xi.48.
♀ (M.C.Z. 51595) Chitala River. 15.xii.48.
3 ♂♂, 1 ♀ (M.C.Z. 51596–9) Ruo River. 8–10.iv.49.

Records. Mlanje Mtn. (Bogert); Shire Highlands (G); Zomba (B).

Native name of Defilippi's Night Adder. *Kasambwe* (Nyanja, but generic).

Variation. Midbody scale-rows 17; ventrals 114–128; anal 1; subcaudals 13–18; upper labials 6, excluded from orbit; preoculars 1–2; postoculars 2; suboculars 1–3; temporals 2 + 3.

Color. The Nchenachena snake resembled *resimus* and differed from any *defilippii* I have previously seen in being a dark velvety green ground color against which the rich black markings showed to advantage.

Size. Largest ♂ (M.C.Z. 51598), 360 (335 + 25) mm.; larger ♀ (M.C.Z. 51597), 413 (385 + 28) mm.; smallest ♂ (M.C.Z. 51596), 178 (166 + 12) mm. on April 4th.

Breeding. On December 15, at Chitala River, a ♀ held 6 eggs *ca.* 11 x 6 mm.

Parasites. Cestodes (U.S. Dept. Agric. 41284) from a Ruo snake await identification.

Bitis arietans arietans (Merrem)

Cobra lachesis Laurenti, 1768, Syn. Rept., p. 104: No locality.
Vipera (*Echidna*) *arietans* Merrem, 1820, Vers. Syst. Amphib., p. 152: Cape of Good Hope.
Clotho arietans Günther, 1893 (1892), p. 555.
Bitis arietans Boulenger, 1896d, p. 493; 1897e, p. 801; Johnston, 1897, pp. 359, 362; 1898, pp. 359, 361a; Duff, 1906, p 137; Mitchell, 1946, p. 42.
Bitis lachesis Bogert, 1940, p. 99.

♂ (A.M.N.H. 67779) Kasungu. 19–23.viii.46.
♂ (A.M.N.H. 67792) Cholo Mtn. 18.ix.–1.x.46.

2 ♀ ♀ (A.M.N.H. 67768–9) Likabula R. 19.vi.–18.vii.46.
♂ (M.C.Z. 51600) Misuku Mtns. 27.ix.48.
♂ (M.C.Z. 51601) Nchisi Mtn. 25.xi.48.
♂ (M.C.Z. 51602) Mwera Hill. 13.xii.48.
♂, 2 ♀ ♀ (M.C.Z. 51603–5) Chitala R. 14–18.xii.48.
2 ♂♂, 3 ♀ ♀ (M.C.Z. 51606–10) Mtimbuka. 8–18.ii.49.
2 ♂♂ (M.C.Z. 51611–2) Likabula R. 27.vii.48.
♂ (M.C.Z. 51613) near Tete, M. 21.i.49.

Records. Blantyre (M); Chiradzulu (B); Chiromo (M); Karonga (Bogert); Lake Nyasa (B); "Nyika Plateau" (B); Port Herald (M); Shire Highlands (G); Zomba (B).

Native names for Puff Adder. *Kipili* (Misuku); *lipili* (Yao); *mpili* (Chewa; Manganja; Nyanja; Ngoni).

Nomenclature. Laurenti's generic name *Cobra*, ignored by common consent for almost a century, was revived by Stejneger (1936b, p. 140) only to be suppressed by the International Commission on Zoological Nomenclature (1945, pp. 77–87. Opinion 188) on the grounds that strict adherence to the rules of priority would "result in greater confusion than conformity." In validating the use of *Bitis* Gray, 1842, the commission designated *Vipera* (*Echidna*) *arietans* Merrem as genotype.

Unfortunately in his appeal to the Commission, Parker did not raise the question of the subspecific name *lachesis* which, since 1936, has been used less than a dozen times. Yet the medical reasons for surpressing *Cobra* are involved, though admittedly to a slightly less extent, in the use of *lachesis* for what is probably the commonest viper in Africa with a distribution ranging from Morocco to the Cape. *Bitis arietans* has been consistently used in herpetological literature over 250 times between 1849 and 1949; to change it for a name long associated with the pit vipers of Tropical America is too pedantic for me to contemplate.

Trinomials are necessary as Parker (1949, p. 101) has separated Somali specimens whose subcaudals he found to be keeled distally. The subcaudals of Nyasaland Puff Adders are smooth, except in a young ♀ and ♂ (M.C.Z. 51603; 51606) whose distal subcaudals show slight keeling.

Variation. Midbody scale-rows 31–33; ventrals 127–140; anal 1; subcaudals 17–36; upper labials 12–15.

Size. Largest ♂ (M.C.Z. 51600), 935 (810 + 125) mm.; largest ♀ (M.C.Z. 51609), 688 (635 + 53) mm.

Sexual dimorphism. Subcaudals in ♀♀ 17–21, in ♂♂ 28–36; in addition the tails of the latter are proportionately longer.

Breeding. Data suggesting that young vipers are born in November were furnished by the finding in the garden at Chitala (mid-December) of three snakes so young that their umbilical scales were not always healed, their lengths ranged from 216 to 224 mm., while three from the garden at Mtimbuka (mid-February) ranged from 231 to 242 mm.

Diet. Two held rodent fur, apparently that of a house rat in the case of the 34-inch male which I found coiled beneath a palm frond at the edge of the Mtimbuka garden in which the three young were found.

Atheris nitschei rungweensis Bogert

Plate 5, figure 1

Atheris nitschei rungweensis Bogert, 1940, Bull. Am. Mus. Nat. Hist., **77**, p. 104, fig. 18: Rungwe Mountains, Tanganyika Territory.

2 ♂ ♂, 2 ♀ ♀ (M.C.Z. 51614–7) Misuku Mtns. 22.ix.–6.x.48.

Records. Not only do these specimens constitute the first record of the occurrence of *Atheris* in Nyasaland, but they involve a slight southerly extension of the generic range.

Variation. Midbody scale-rows 27–31; ventrals 156–164; anal 1; subcaudals 49–58; upper labials 10–12; interorbital scales across crown 11–13; scales between mental and first ventral.

The previous high for ventrals was 162, and for subcaudals 56 in the typical Central African race; from which *rungweensis* is distinguishable only by its keeled gulars, not so pronounced in the two smallest specimens listed above. For discussion *vide* Loveridge (1942e, p. 313).

Size. Larger ♂ (M.C.Z. 51614), 440 (370 + 70) mm.; larger ♀ (M.C.Z. 51615), 642 (550 + 92) mm.

Diet. A cricket frog (*Phrynobatrachus u. ukingensis*) had just been swallowed by one Rungwe Sedge-Viper which held the undigested posterior half of another in its stomach.

Habitat. All were taken on the fringes of Matipa Forest, the one just mentioned being on a sunny bank at the edge of swampy ground where cricket frogs were plentiful; another was beneath a stone near a stand of wild bananas in a gully; a third was taken beneath a bush at the forest-edge.

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[1] Where a date is followed by a letter of the alphabet it indicates that during the year cited the author in question published more than one paper on African herpetology. The letter has chronological significance in a more comprehensive bibliography of African herpetology (1880–1953) which it is hoped may be published in the not too-distant future.

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APPENDIX I

Synoptic Keys to Assist in the Recognition of Nyasaland Reptiles

Key to the Orders of Nyasaland Reptiles

1. Body enveloped in a bony shell consisting of an upper (carapace) and lower (plastron) portion ..... Testudinata
(Tortoises & Turtles)

   Body not enveloped in a bony shell 2
2. Body protected by horny shields that on the back, and sometimes on the belly, overlie bony plates; anal opening longitudinal ..... Crocodylia[1]
(Crocodiles)

   Body protected chiefly by scales (fused in worm lizards) or granules; anal opening transverse 3
(Squamata)
3. The two halves of the lower jaw united by a suture; most (but not all) species have a movable eyelid and four limbs (some are limbless) .. Sauria
(Lizards and Chameleons)

   The two halves of the lower jaw united by a more or less elastic ligament; eyelids transparent. immovable; no limbs ..... Serpentes
(Snakes)

Key to the Tortoises and Turtles of Nyasaland

1. Upper shell covered with smooth or pitted skin; snout projecting as a soft proboscis ..... *C. frenatum*
(Zambezi Mud-Turtle)

   Upper shell covered with horny shields; snout not projecting as a soft proboscis 2
2. Neck hidden when head is withdrawn into shell 3

   Neck fully exposed (by being bent to one side) when head is sheltering beneath shell 4
3. Shell height included in its length from 1.61 to 2.07 times; posterior portion of carapace immovable ..... *T. p. babcocki*
(Eastern Leopard Tortoise)

   Shell height included in its length from 2.14 to 2.58 times; posterior portion of carapace *in adults only* movable by a leathery hinge anterior to each hind limb ..... *K. b. belliana*
(Eastern Hinged Tortoise)
4. Anterior lobe of plastron immovable; pectoral shields participating equally with abdominals on bridge ..... *P. s. subrufa*
(Southern Marsh-Terrapin)

[1] Only one species in Nyasaland, *C. niloticus*.

Anterior lobe of plastron movable in adults; pectoral shields almost excluded from bridge by abdominals.....5

5. Plastron entirely black, entirely yellow, or yellow with darker infuscations, the latter *not* forming a sharply defined angular pattern round the periphery; its anterior lobe *always* longer than the suture between the abdominals; posterior margin of carapace usually rounded; narrowest interorbital width equal to, or slightly longer, or slightly shorter than the suture between the supraorbitals.....*P. subniger*
(Black Terrapin)

Plastron yellow (white) broadly edged with black, the latter forming a sharply defined angular pattern round the periphery (sometimes blurred or masked in old individuals with a carapace length of 250 mm. or more); its anterior lobe longer than the suture between the abdominals (equal to or slightly shorter in old specimens); posterior margin of carapace sharply serrate except in very old terrapin; narrowest interorbital width only two-thirds the length of the suture between the supraorbitals.....
..... *P. sinuatus*
(Serrated Terrapin)

Key to the Families of Lizards of Nyasaland [1]

1. Limbs present; body not unusually elongate.....2
Limbs absent or vestigial; body attenuated.....9

2. Upper surface of head covered with granules or tubercles.....3
Upper surface of head covered with symmetrical shields.....6

3. Digits dilated, with subdigital scansors or lamellae; eyelids immovable; dentition pleurodont.....GEKKONIDAE
(Geckos)

Digits slender, without subdigital scansors; eyelids movable.....4

4. Tongue short, broad, covered with villose papillae, neither deeply divided nor withdrawable into a sheath, in life rarely protruded except when drinking; dentition acrodont.....AGAMIDAE
(Agamas)

Tongue very long and slender, not covered with papillae.....5

5. Tongue cylindrical, extensile, projectile, its tip club-shaped; dentition acrodont; digits opposed for grasping branches..CHAMAELEONIDAE
(Chameleons)

Tongue elongate, its tips deeply forked, threadlike, in life constantly flickering in and out like those of a snake, withdrawable into a sheath; dentition subpleurodont; digits in a single plane.....VARANIDAE
(Monitors)

[1]For which country alone the definitions are applicable and not necessarily elsewhere in the continent. Nor has it been deemed essential to adhere strictly to the usual systematic sequence of families as employed elsewhere in this paper.

6. Tongue short, covered with hair-like papillae, its tip entire or feebly nicked, scarcely protractile; femoral pores present in both sexes but sometimes indistinct in females; tail regularly ringed with whorls of strongly keeled or spinose scales . . . . . CORDYLIDAE (Girdled Lizards)

Tongue moderately long, covered with scale-like papillae anteriorly, plicae posteriorly 7

7. Body scales smooth, glossy, imbricate, with underlying bony plates; no lateral fold; no femoral pores . . . . . SCINCIDAE (part) (Skinks)

Body scales more or less rugose, keeled or granular; femoral pores usually present, at least in males 8

8. Bony plates underlying the large shields or scales covering the back; side with a well-defined granular fold . . . . . GERRHOSAURIDAE (Plated-Lizards)

No bony plates underlying the granular scales or plates covering the back; side without a well-defined fold along the flank . . . . . LACERTIDAE (Typical Lizards)

9. Appearance snake-like; eyes distinct; a lower eyelid; body covered with glossy, overlapping scales; color dark olive or iridescent black . . . . . SCINCIDAE (part) — (Skinks)

Appearance worm-like; eyes, if distinguishable, concealed beneath a head shield; body covered with squarish segments of soft skin; putty colored or pinkish white . . . . . AMPHISBAENIDAE (Worm-Lizards)

Key to the Geckos of Nyasaland

1. Distal digital joint compressed and rising angularly from within, or from the end of, the digital expansion 2

Distal digital joint neither compressed nor rising from *within* the digital expansion, which is furnished below by numerous oblique or transversely dilated scansors and lamellae; range: Africa south of equator . . . . . 7 (*Pachydactylus*)

2. Free distal digital joint long, rising from within the end of the digital expansion; thumb present and clawed; postanal slits present in both sexes; tail tip without oblique scansors or lamellae; pupil vertical; range: Africa south of 20° N., etc. . . . . 3 (*Hemidactylus*)

Free distal digital joint short, rising from the end of a strongly dilated discoid expansion, digits subcylindrical at base; thumb rudimentary, clawless; postanal slits absent in both sexes; *original* tail with oblique scansors or lamellae beneath tip; pupil round; range: Africa from about 15° N. to 30° S., etc. . . . . 4 (*Lygodactylus*)

3. Scansor rows under first toe 5–7, under fourth toe 7–11; upper labials 9–14; lower labials 7–11; preano-femoral pores in males 24–60; length from snout to anus in adults 50–86 mm.; egg 10–12 mm. in diameter, usually cemented together in pairs; range: Tropical Africa; Madagascar; Mauritius; West Indies..... *H. mabouia*
(House Gecko)

Scansor rows under first toe 4–6, under fourth toe 6–9; upper labials 8–12; lower labials 7–11; preano-femoral pores in males 24–34; length from snout to anus in adults 41–53 mm.; egg 8–9 mm. in diameter, each egg separate and distinct; range: East Africa from Kenya to Mozambique; Madagascar; Aldabra Islands; Seychelle Islands..... *H. mercatorius*
(Palm Gecko)

4. Mental (chin shield) normally with deep lateral fissures resulting from fusion with a former large postmental.....5
Mental (chin shield) entire, without trace of lateral fissures; subcaudals with median row strongly enlarged transversely.....6

5. Subcaudals equal, the median row *not*, or but irregularly and occasionally enlarged; snout broad; preanal pores in males 4–7; range: Africa south of the equator, i.e. in the east northwards to central Kenya..... *L. capensis*
(Cape Gecko)

Subcaudals with median row strongly enlarged transversely; snout elongate; preanal pores in males 4–8; range: Tanganyika Territory south to Mozambique (as yet *unknown* from Nyasaland)..... *L. g. grotei*
(Grote's Gecko)

6. Rostral entering nostril; latter situated above the suture between rostral and first labial; postmentals 1–3; throat of ♂ and ♀ with a series of dark lines converging from labials to base of throat, the anterior forming two V-shaped marks the apex of the second prolonged posteriorly as a single line; range: southern Tanganyika Territory and Nyasaland.. *L. a. angularis*
(Angle-throated Gecko)

Rostral almost invariably separated from nostril; latter situated above first labial so *posterior* to (rarely above) the suture between rostral and first labial; postmentals 3; throat of ♂ adult uniformly black, only rarely showing traces of Λ-chevrons, throat of ♀ normally white, only occasionally showing faint obsolescent markings; range: (? Somalia) Kenya Colony (coastal belt from Mombasa) south to Tanganyika Territory and adjacent islands. Northern Rhodesia and adjacent Belgian Congo; Mozambique (its distribution complicated by its transportation in egg form along coast, rivers, and railways, through human agency; as yet *unknown* from Nyasaland)..... *L. p. picturatus*
(Yellow-throated Gecko)

7. Scansors under fourth toe 3–7; cheeks not or but slightly swollen; length from snout to anus in adults less than 70 (30–50) mm.; nape and back showing 3 broad, black-edged, cream-colored crescentic markings; original

tail with 7 more; range: Nyasaland..... *P. c. oshaughnessyi*
(Cape Maclear Gecko)

Scansors under fourth toe 8–13; cheeks swollen; length from snout to anus of adults over 70 (75–95) mm.; back and tail usually showing irregular, wavy, brown or black crossbars, those on back posteriorly edged with white; range Belgian Ruanda and Tanganyika Territory south to Mozambique, west to Angola, etc..... *P. b. turneri*
(Zambezi Gecko)

Key to the Agamas of Nyasaland

1. Some dorsolateral scales greatly enlarged.....2
   All dorsolateral scales uniform; occipital (pineal eye) scale larger than those surrounding it; scales on upper surface of tibia subequal.....3
2. Occipital scale no larger than those surrounding it; enlarged dorso-lateral scales irregularly scattered among the others; scales around midbody 100–133; scales on upper surface of tibia unequal; fifth toe extending far beyond first..... *A. cyanogaster*
   Black-necked Agama

   Occipital scale larger than those surrounding it; enlarged dorso-lateral scales arranged in more or less longitudinal rows; scales around midbody 72–90; scales on upper surface of tibia subequal; fifth toe usually extending as far as first..... *A. h. armata*
   Zambezi Spiny Agama
3. Scales around midbody (69) 72–94; lower temporal area between angle of jaw and tympanum covered with small, but not minute, scales, restricted; head of adult male blue and/or brown, throat rich blue (occasionally with a dusky basal blotch)..... *A. m. mossambica*
   Mozambique Tree-Agama

   Scales around midbody 96–118; lower temporal area between angle of jaw and tympanum covered with minute scales, extensive; head of adult male red and/or brown, throat brown-orange to orange-red with a conspicuous dark blue basal patch (throats of immature males and females have longitudinal dusky streaks, those of juveniles under 56 mm. in length from snout to anus, white)..... *A. k. kirkii*
   Kirk's Rock-Agama

Key to the Chameleons of Nyasaland

1. Tail almost as long as, or longer than, the head and body.....2
   Tail not more than a quarter the length of the head and body.....6
2. Throat, chest and belly with a median crest of enlarged white scales....3
   Throat, chest and belly without a median crest of enlarged white scales..5
3. Each skin-flap on side of head with 4–5 scales, including small marginals,

across it from front to rear; total length of adults less than a foot; range: Shire Highlands.....*C. d. isabellinus*
(Shire Flap-necked Chameleon)

Each skin-flap on side of head with 6–8 (exceptionally 4–5) scales, including small marginals, across it from front to rear.....4

4. Total length of adults less than a foot; range: *in Nyasaland* at altitudes usually over 1,700 ft.....*C. d. dilepis*
(Common Flap-necked Chameleon)

Total length of adults more than a foot; range: *in Nyasaland* at altitudes usually under 1,700 ft.....*C. d. petersii*
(Giant Flap-necked Chameleon)

5. Snout bearing a prominent horn (or knob in very young); back of head with a pair of movable (except in very young) skin-flaps; range: Tanganyika Territory south to Mozambique and Nyasaland.....*C. melleri*
(Giant One-horned Chameleon)

Snout without trace of a horn; back of head without skin-flaps; range: Nyika Plateau above 7,000 ft.....*C. g. nyikae*
(Nyika Goetze's Chameleon)

6. No pit in groin.....7

A pit in groin as well as one in axilla; interorbital region with a curved non-angular, transverse series of enlarged granules.....8

7. No pit in axilla; snout terminating in a more or less distinctly flexible rostral process; interorbital region with a somewhat angularly arranged, transverse series of enlarged granules; vertebral line weakly crenulate, the granules on the humps not, or but slightly, enlarged; size moderate; range: montane forests north and east of Lake Nyasa as far south as Nchisi....
B. nchisiensis
(Pitless Short-tailed Chameleon)

A pit in axilla; snout without a flexible rostral process; interorbital region *without* a transverse series of enlarged granules; vertebral line not or but indistinctly crenulate, scattered with numerous, strongly-enlarged, conical tubercles as on flanks; size very small; range: Shire Highlands of Nyasaland; Mozambique.....*B. b. brachyura*
(Nyasaland Short-tailed Chameleon)

8. Humps along crenulated vertebral line covered with granules scarcely larger than those in the intervening hollows; supraciliary ridge *with* a single small, flexible tubercle or horn-like process (not shown in figure); range: lower slopes of Shire Highlands, Nyasaland.....*B. p. platyceps*
(Flat-headed Short-tailed Chameleon)

Humps along crenulated vertebral line formed of much-enlarged, spine-like granules; supraciliary ridge *without* a raised tubercle or horn-like process, or but slightly indicated; range: upper slopes of Mlanje Mountain, Nyasaland.....*B. p. carri*
(Plateau Short-tailed Chameleon)

Key to the Skinks of Nyasaland

1. Lower eyelid movable, in its centre a large transparent disk; limbs well developed 2
   Lower eyelid, if movable,[1] scaly; if immovable, then transparent and covering the eye like a watchglass; limbs present or absent 11
2. Subocular bordering the lip 3
   Subocular separated from the lip by labials 10
3. Suboculars not narrowed below but resembling the labials except for its larger size; scales on soles not spinose 4
   Subocular distinctly narrowed below; scales on soles sharply spinose 6
4. Midbody scale-rows 44–48; adult males lack the light longitudinal lines characteristic of the blue-tailed females and young; habitat restricted to rocky outcrops ..... *M. q. obsti*
   (Tanganyika Five-striped Skink)
   Midbody scale-rows less than 42 5
5. Midbody scale-rows 34–36; body stout; tail moderate; habitat chiefly virgin-forest-edge ..... *M. m. comorensis*
   (Comoro Spotted-lip Skink)
   Midbody scale-rows 30–32; body slender; tail very long; habitat chiefly dry savanna forest ..... *M. m. boulengeri*
   (Makonde Spotted-lip Skink)
6. No light longitudinal line on side; midbody scale-rows 36–40 (though 34–42 for *striata* from the entire continent) 7
   A conspicuous light longitudinal line on side; midbody scale-rows 30–36 . 9
7. Back olive or brown with or without black flecks, if traces of dorsolateral line present it is scarcely distinguishable; size small; habitat in arid country near rocky outcrops ..... *M. lacertiformis*[2]
   (Lizard-like Skink)
   Two or three conspicuous light lines on back 8
8. Two light dorsolateral lines on back ..... *M. s. striata* (part)
   (Common Two-striped Skink)
   Three light longitudinal lines on back; midbody scale-rows 36–38; habitat in grasslands at 6000 feet on Lichenya Plateau, Mlanje Mtn. .....
   M. b. mlanjensis
   (Mlanje Three-striped Skink)
9. Centre of nostril *directly above* the vertical of the suture between rostral and first labial; supraciliaries usually 4, rarely 5; midbody scale-rows 34–36; habitat in grasslands at 7000 feet on Nyika Plateau . . *M. v. nyikae*
   (Nyika Variable Skink)

[1] Except in the snake-like *Riopa johnstoni* which is characterized by vestigial limbs, see 16.

[2] Boulenger (1887a, pp. 154, 159) erred in saying this species has non-spinous soles. In the above key *M. s. ellenbergeri* Chabanaud would fall here, but this Zambezi species is unknown from Nyasaland. From *lacertiformis* it is immediately distinguished by the presence, at least anteriorly, of a conspicuous broad black lateral band, and its much larger size.

Centre of nostril *posterior to* the vertical of the suture between rostral and first labial; supraciliaries usually 5, rarely 4; midbody scale-rows 30–34; habitat from sea level to 6000 feet on Mlanje Mountain....*M. v. varia*
(Tete Variable Skink)

10. Three light longitudinal lines on back, which is heavily spotted like the sides; underside (except in young) plumbeous; habitat in grasslands at 7000 feet on Nyika Plateau.....*M. hildae*
(Nyika Three-striped Skink)

Two conspicuous light dorsolateral lines on an otherwise usually uniformly brown back; underside white; habitat ubiquitous but chiefly on huts, houses, and trees from sea level to about 6000 feet..*M. s. striata* (part)
(Common Two-striped Skink)

11. Lower eyelid immovable, transparent, covering the eye like a watchglass; size small; limbs well developed; habitat principally in dry bush, especially among dead leaves.....*A. wahlbergii*
(Wahlberg's Snake-eyed Skink)

Lower eyelid movable, scaly (except in *Riopa johnstoni*); limbs present or absent.....12

12. Limbs well developed though relatively short.....13
Limbs minute or entirely absent; body elongate, serpentiform.....16

13. Nasal opening between the rostral and a very small nasal shield which may be reduced to a narrow ring.....14
Nasal opening separated from the rostral by a nasal shield; midbody scale-rows 24–28.....15

14. Midbody scale-rows 22; limbs five-toed; lamellae beneath fourth toe 11; range: Mlanje Mountain south to Vumba Mountain, Southern Rhodesia .....*S. arnoldi*
(Arnold's Skink)

Midbody scale-rows 24; limbs four-toed; lamellae beneath fourth toe 3; range: Uluguru Mountains and eastern Tanganyika Territory south to Mlanje.....*S. t. tetradactylus*
(Four-toed Skink)

15. Nasal opening between three shields, viz. a supranasal, anterior nasal, and postnasal; habitat in loose soil beneath logs or vegetable debris throughout East and South Africa.....*R. sundevallii*
(Sundevall's Skink)

Nasal opening between two shields, viz. a supranasal that has fused with the anterior nasal, and a postnasal; habitat as last, but range is only from Somalia south to Nyasaland.....*R. m. modesta*
(Mpwapwa Skink)

16. Lower eyelid with an undivided transparent disk; limbs vestigial, the anterior ending in a single point, the posterior in two points; habitat: in grasslands of the Nyika Plateau.....*R. johnstoni*
(Johnston's Skink)

Lower eyelid scaly; no limbs 17

17. Below from chin to anus longitudinally striped with brown due to a dark spot in the centre of each scale, but old individuals may be uniform white; habitat in rich loam or damp soil in the Misuku Mountains .....
M. a. misukuensis
(Misuku Limbless Skink)

Below from chin to anus uniformly black like the tail and entire upper surface; range: Misuku Mountains south to the Zambezi River . . *M. a. ater*
(Black Limbless Skink)

Key to the Gerrhosauridae of Nyasaland[1]

1. Ventrals transversely across midbelly 14–20; dorsals transversely 28–34, longitudinally 50–56; lamellae beneath fourth toe 18–23; range: Orange Free State and Transvaal north to Mozambique and Nyasaland .....
G. v. validus
(Giant Plated-Lizard)

Ventrals transversely across midbelly 8–10; along either side of back a black-edged white or (light) line 2

2. Ventrals in 10 rows across midbelly 3

Ventrals in 8 rows across midbelly 4

3. Above, head only buff though back anteriorly largely so, while posteriorly, as also on sides and tail, many scales are streaked with black or dark brown among which large buff blotches or spots are prominent; belly usually streaked with dusky; range: Zululand and Transvaal north to Morogoro, Tanganyika Territory ..... *G. m. grandis*
(Greater Plated-Lizard)

Above, head and body uniform buff or fulvous brown; belly uniform yellowish; range: Northern Rhodesia (?) and Tete, Mozambique up east coasts of Tanganyika Territory and Kenya Colony; also Zanzibar .....
G. m. major[2]
(Great Plated-Lizard)

4. Supraciliaries 4, very rarely 3 or 5; prefrontals broadly in contact, very rarely separated; distance from end of snout to back of ear included in distance from snout to anus 3.25 (hatchling) to 5 (adults) times; basic coloring usually sandy rufous-brown; range: Bechuanaland and Transvaal north to Kenya highlands and west to Gaboon ..... *G. n. nigrolineatus*
(Black-lined Plated-Lizard)

Supraciliaries 5, very rarely 4 or 6; prefrontals separated, rarely in contact; distance from end of snout to back of ear included in distance from snout to anus 4.8 (young) to 6 (adults) times; basic color usually dark olive;

[1] In counting ventrals omit outermost row of half-sized ones; dorsals are counted longitudinally from the back row which is *in line with* the posterior edge of the anal, right up to the large head shields; meticulous precision is required in measuring head lengths as a millimetre error may lead to wrong conclusions.

[2] As yet unknown from Nyasaland.

range: Cape Province east to Natal, north to Northern Rhodesia, Mozambique and Nyasaland ..... *G. f. flavigularis*
(Yellow-throated Plated-Lizard)

Key to the Lacertidae of Nyasaland

1. Frontoparietals absent; a double series of large, smooth, transverse, plate-like shields extending from nape along back and tail; toes serrated laterally on basal half; tail much depressed and fringed laterally; habitat arboreal; range: Tanganyika Territory south to Mozambique ..... *H. g. laevis*
(Eastern Tree-Lizard)

   Frontoparietals present; no vertebral series of greatly enlarged, plate-like shields; toes not serrated laterally; tail cylindrical, long and tapering; habitat terrestrial 2

2. Dorsal scales smooth, granular, juxtaposed; subdigital lamellae smooth or tubercular; range: Nyasaland and Mozambique ..... *N. i. ornata*
(Ornate Scrub-Lizard)

   Dorsal scales keeled, not granular, either juxtaposed or imbricate; subdigital lamellae keeled 3

3. Collar well-developed; nostril between 3–4 nasals and the first labial, or separated from latter by a narrow rim; range: Tanganyika Territory south to Mozambique, west to Southern Rhodesia ..... *L. johnstoni*
(Johnston's Scrub-Lizard)

   Collar absent; nostril between 2–3 nasals only 4

4. Frontonasal single; subocular usually bordering the lip; midbody scales *and* ventrals 34–38 (40); femoral pores 8–15 on either limb; range: Nyasaland south to Zululand, west to Transvaal, north to Belgian Congo .....
I. capensis
(Smith's Rough-scaled Sand-Lizard)

   Frontonasal longitudinally divided; subocular not bordering the mouth; midbody scales *and* ventrals 44–50 (58); femoral pores 12–17 on either limb; range: Tanganyika south to Zululand, west to Southwest Africa ....
I. squamulosa
(Peter's Rough-scaled Sand-Lizard)

Key to the Genera of Amphisbaenidae Likely to Occur in Nyasaland

1. Snout feebly compressed or rounded; nostrils lateral; no gular fold; pectoral segments (scales) not enlarged; a vertebral line .... *Amphisbaena*[1]
   Snout depressed, sharp-edged, shovel-shaped; nostrils inferior; a gular fold; pectoral segments (scales) enlarged but subject to subdivision; no vertebral line 2

2. Tail bluntly rounded; preanal pores present or absent ..... *Monopeltis*[2]
   Tail abruptly truncate, ending in a callous pad; preanal pores absent ....
Tomuropeltis[3]

[1] No species of *Amphisbaena* or *Chirindia* have been recorded from the Nyasaland Protectorate as yet, though occurring in adjacent territories.

[2] *Monopeltis sphenorhynchus* Peters of the Shire Valley is the sole species as yet reported and of its distribution little is known.

[3] *Tomuropeltis* Laurent is the name applicable to the worm-lizards referred to *Dalophia* Günther in my (1941a, p. 428) revision except for the genotype *welwitschii* which Laurent has shown to be a *Monopeltis*.

Key to the Cordylidae of Nyasaland

1. Back covered with rows of large rugose scales; tail covered with whorls of strongly spinous scales; femoral pores 5–8, present in both sexes; range: Kenya Colony south to Mozambique and Southern Rhodesia..... *C. c. tropidosternum*
(Eastern Girdle-tail)

   Back covered with small, smooth granules; tail covered with whorls of rugose or keeled scales; femoral pores 18–21 (?25), present at least in males.....2

2. Upper labials anterior to the subocular 4; ventrals in 12 rows across the belly; femoral pores present in both sexes; range: riverine boulders on slopes of Mlanje Mountain.....*P. mitchelli*
(Mlanje Flat-Lizard)

   Upper labials anterior to the subocular 5–6; ventrals in 18 rows across the belly; femoral pores present in males only; range: rocky terrain in savanna near Mpatamanga Gorge.....*P. g. nyasae*
(Mpatamanga Flat-Lizard)

Key to the Varanidae of Nyasaland

1. Nostril round or oval, slightly nearer the eye than the end of the snout; canthus rostralis angular; digits moderately elongate; build slender; range: Africa exclusive of arid areas in the northwest and southwest, also excepting the western forested areas where the race *ornata* occurs..... *V. n. niloticus*
(Common Water-Monitor)

   Nostril an oblique slit, much nearer the eye than the end of the snout; canthus rostralis rounded; digits relatively short; build robust.....2

2. Nuchal (nape) scales, without surrounding disk, distinctly larger than those on occiput and back; midbody scale-rows 122–154; ventrals longitudinally from collar fold to level of hind limbs 85–100; range: Ethiopia and Somaliland south to the Zambezi River, Mozambique[1]..... *V. e. microstictus*
(Eastern Savanna-Monitor)

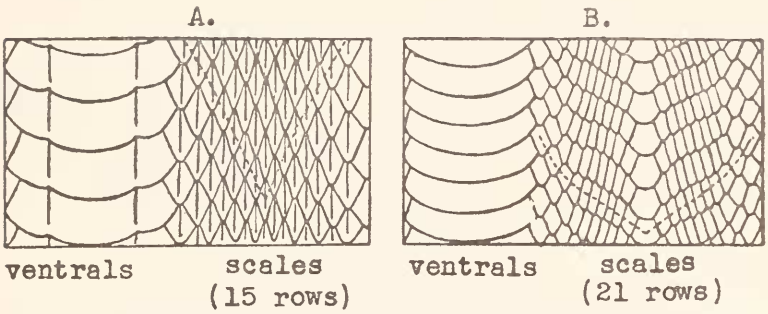
   Nuchal (nape) scales, without surrounding disk, not or but slightly larger than those on occiput and back; midbody scale-rows 133–167; ventrals longitudinally from collar fold to level of hind limbs 85–110; range: Africa south of the Zambezi and Kunene Rivers..... *V. e. albigularis*
(White-throated Savanna-Monitor)

[1] Possibly the young resemble the southern form, see text; much remains to be done to elucidate the limits of range.

Key to the Families of Snakes Found in Nyasaland

1. Body encircled by small scales more or less uniform in size; 3 or 4 scales immediately in front of anus; eye, when distinguishable, beneath a shield .2
   Body not encircled by small scales owing to presence on belly of a longitudinal series of transversely enlarged plates known as ventrals (see fig. 1); 1 or 2 scales immediately in front of anus; eye beneath a transparent scale .3
2. Ocular shield not bordering mouth (see fig. 2); 18 or more scales around middle of body; tail as long as, or only slightly longer than, broad..... TYPHLOPIDAE (Blind-Snakes)
   Ocular shield bordering mouth (see fig. 3); 14 scales around middle of body; tail three times as long as broad at the base....LEPTOTYPHLOPIDAE (Worm-Snakes)
3. Ventral shields narrower than the body; supraocular, if distinct, broken up into two or more shields.....BOIDAE (Boas & Pythons)
   Ventral shields as broad as, or almost as broad as, the body; supraocular, if distinct[1], single (see fig. 4).....4
4. No enlarged poison fangs at front of upper jaw.....COLUBRIDAE (ordinary Snakes)
   One or more pairs of enlarged poison fangs at front of upper jaw.....5
5. Poison fangs immovable, not enclosed in a large sheath of membrane..... ELAPIDAE (Cobra, Mambas, etc.)
   Poison fangs movable and very large, so folded back when not in use, encased in a large sheath of membrane.....VIPERIDAE (Adders & Vipers)

[1] Distinct and large in all East African colubrids and elapids, but absent in the puff adders and certain other vipers.



Scaling of thickest part of body. *A. Gastropyxis smaragdina*, with keeled scales and bicarinate ventral shields on belly. *B. Boiga blandingii*, with oblique scales and enlarged vertebrals, ventrals not keeled. Figs. 1-4 after Boulenger.

Glossary or Reference to Terms Employed

Anal, the shield immediately in front of the anus.
Chin-shields, now called sublinguals (fig. 4).
Frontal (fig. 4).
Internasal (fig. 4).
Loreal (fig. 4).
Labial, one of several scales bordering the upper or lower lips.
Lower labial (fig. 4).
Mental or symphysial (fig. 4).
Midbody scales, those, other than ventral shields, encircling the body at a point midway between snout and anus (figs. 1A, 1B).
Nasal (figs. 2, 3, 4).
Nostril, the aperture situated in a nasal or between scales.
Ocular (figs. 2, 3).
Parietal (fig. 4).
Postocular (fig. 4).
Prefrontal (figs. 2, 3, 4).
Preocular (figs. 2, 4).
Rostral (figs. 2, 3, 4).
Subcaudals, the series of scales beneath the tail.
Sublinguals, preferred name for chin-shields (fig. 4).
Subocular (fig. 4).
Supraoculars (figs. 2, 3, 4).
Symphysial, alternative name for mental (fig. 4).
Temporal (fig. 4).
Upper labial (fig. 4).
Ventral (fig. 1).

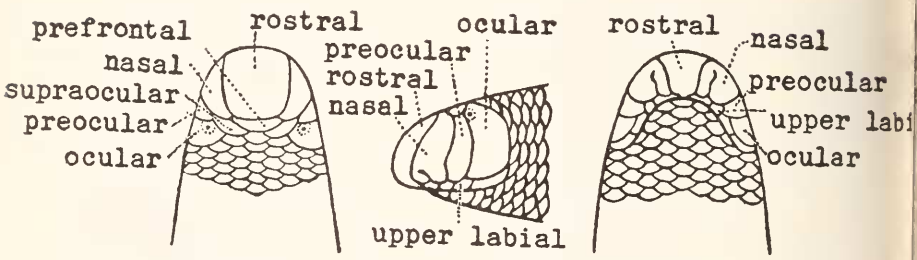
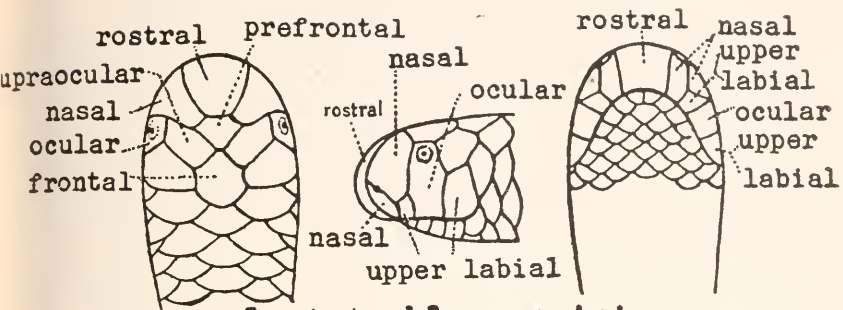
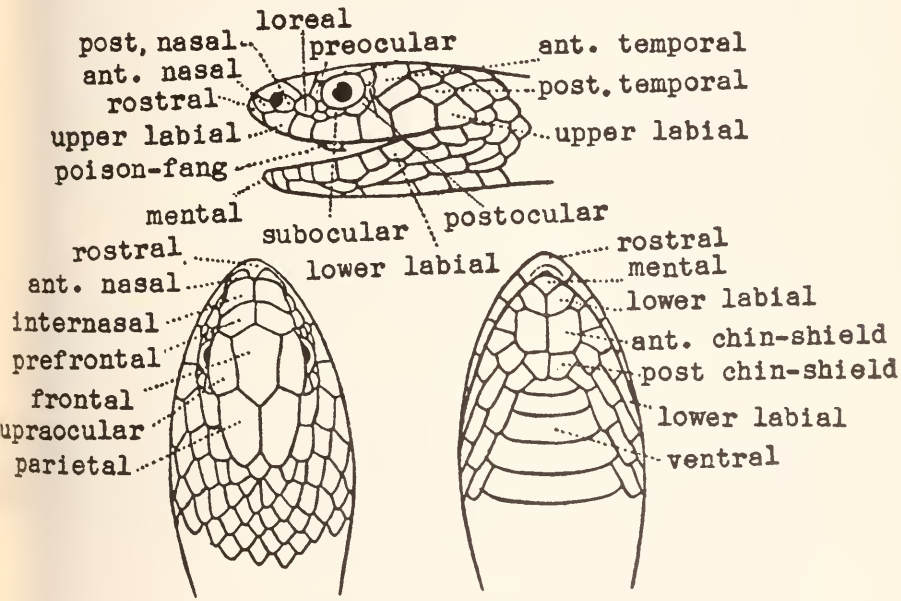


Fig. 2



Leptotyphlops emini.

Fig. 3



Causus rhombeatus.

Fig. 4

Key to the Blind Snakes (Typhlopidae) of Nyasaland

Midbody scale-rows 34 (30–38); snout rounded in young, but with sharply angular edge in adults; midbody diameter 24–40 times in total length; color highly variable; range: in East Africa from Kenya Colony south to the Zambezi..... *T. s. mucruso*
(North Zambezi Blind-Snake)

Midbody scale-rows 22–24; snout rounded throughout life; midbody diameter 44–76 times in total length; color plumbeous above, indistinguishable from some phases of *mucruso;* range: ? southeastern Tanganyika Territory south to the Zambezi..... *T. t. obtusus*
(Shire Blind-Snake)

Key to the Worm Snakes (Leptotyphlopidae) of Nyasaland

Rostral shield in contact with the supraocular; color in life black (fades to brown if exposed to light); midbody diameter 42–74 times in total length; range: obscure, as thought to be south of the Zambezi with *c. conjuncta* north of river..... *L. c. distanti*?
(Distant's Worm-Snake)

Rostral shield separated from the supraocular; color in life flesh pink (fades to white after death); midbody diameter 46–81 times in total length; range: Somaliland south through Mozambique, Nyasaland and Northern Rhodesia to Tete, on the Zambezi (its type locality)..... *L. longicauda*
(Long-tailed Worm-Snake)

Key to the Pythons (Boidae) of Nyasaland

Though Africans have names for, and profess to distinguish several of the color phases, and while Europeans frequently miscall it "boa," herpetologists recognize but one species in Nyasaland..... *P. sebae*
(Rock or Water-Python)

Key to the Ordinary Snakes (Colubridae) of Nyasaland

(Though I have endeavoured to devise a key without recourse to dentitional characters, which are admittedly difficult to discern at times, this has not always been possible. When in doubt follow up both alternative branches of the key and then consult the main body of this paper for further details concerning the species of final choice).

1. A loreal shield present between postnasal and preocular; subcaudals in pairs..... 2
   No loreal shield normally (present in 4 per cent of *Duberria* which is recognizable by a combination of an entire nasal, low number of ventrals and divided subcaudals)..... 18

2. Anal entire (occasionally divided in *Telescopus*); pupil vertically subelliptic (except in *Lycodonomorphus* where it is sometimes subcircular or even round) 3
   Anal divided; pupil round or horizontal (horizontal only in *Thelotornis*) .. 9
3. Scales on back smooth 4
   Scales on back keeled 8
4. Snout rounded; prefrontals and internasals paired 5
   Snout with angular horizontal edge; prefrontal single 17
5. Midbody scale-rows 25–33 ..... *B. l. lineatus*
   (House-Snake)
   Midbody scale-rows 17–21 6
6. No pair of enlarged grooved fangs situated below the posterior border of the eye 7
   A pair of enlarged grooved fangs situated below the posterior border of the eye, separated by an interspace from the preceding teeth 23
7. Nostril directed upwards from between two nasals; midbody scale-rows 19[1]; ventrals 159–170; aquatic ..... *L. r. whytii*
   (Whyte's Water-Snake)
   Nostril directed outwards from a single nasal followed by a postnasal; midbody scale-rows 17; ventrals 171–214; terrestrial ..... *L. c. capense*
   (Cape Wolf-Snake)
8. Ventrals 203–224; subcaudals 47–58; color of vertebral scale-row distinct from that of dorsals and laterals ..... *M. c. capense*
   (Cape File-Snake)
   Ventrals 171–176; subcaudals 55–71; color of vertebral scales similar to that of dorsals and laterals ..... *M. nyassae*
   (Nyasa File-Snake)
9. Midbody scale-rows 25–31; snout rather prominent ..... *P. cana*
   (Mole Snake)
   Midbody scale-rows 11–21 10
10. Pupil round 11
    Pupil horizontal; midbody scale-rows 19; body attenuated with vine-like coloring above and below 35
11. No pair of enlarged grooved fangs situated below the posterior border of the eye 12
    A pair of enlarged grooved fangs situated below the posterior border of the eye, separated by an interspace from the preceding teeth 25
12. Midbody scale-rows 21; ventrals 175–204 ..... *M. semiornata*
    (Semiornate Snake)
    Midbody scale-rows 19 or fewer 13
13. Midbody scale-rows 19; ventrals 128–149 ..... *N. o. olivacea*
    (Olive Marsh-Snake)

[1] If 21, with throat and belly pure white, then it is the Cholo to Zomba race ..... *L. r. mlanjensis*
(Mlanje Water-Snake)

Midbody scale-rows 17 or fewer 14

14. Midbody scale-rows 17; ventrals 125–144 ..... *N. o. uluguruensis*
(Montane Marsh-Snake)

Midbody scale-rows 15; color in life green (darkens in formalin); arboreal 15

15. Usually 2 labials enter the orbit; subcaudals rounded, 77–106 (77–90 in ♀ ♀; 88–106 in ♂ ♂) ..... *P. hoplogaster*
(Southeastern Green-Snake)

Usually 3 labials enter the orbit; subcaudals 90–162 16

16. Subcaudals rounded, 90–121 (90–117 in ♀ ♀; 103–121 in ♂ ♂) ..... *P. i. irregularis*
(Western Green-Snake)

Subcaudals angular, laterally keeled and notched like the ventrals, 126–162 (no sexual differentiation) ..... *P. s. semivariegatus*
(Spotted Bush-Snake)

17. Internasals paired; temporals 2 + 2 or 2 + 3; size moderate; color above, brown with ladder-like markings along the back (*unknown* from Nyasaland, but occurring in Mozambique) ..... *P. lineatus*
(Striped Shovel-snout)

Internasal single; temporals 1 + 1, 1 + 2 or 1 + 3; size small; color above, plumbeous, with or without white flecking ..... *P. a. stuhlmanni*
(Eastern Shovel-snout)

18. Subcaudals in pairs 19

Subcaudals single 37

19. Midbody scale-rows smooth, in 15 rows; pupil round; anterior temporal single; color above, olive or brown, uniform ..... *D. l. shirana*
(Shire Slug-eater)

Midbody scales in 17 or more rows 20

20. Midbody scales smooth, in 19 or 21 rows; pupil round; temporal single; color above, uniformly plumbeous or iridescent black 36

21. Subcaudals of ♂ ♂ more than 77 (78–94), of ♀ ♀ more than 62 (63–87); color above, pinkish brown, usually with numerous, narrow, dark, sometimes light-edged, crossbands, Ω-shaped anteriorly, posteriorly transverse and coalescing on dorsum with a more or less distinct vertebral band; usually found on reddish laterite soil of coastal plain up to 3000 feet ..... *D. s. medici*
(Rufous Egg-eater)

Subcaudals of ♂ ♂ less than 75 (51–74), of ♀ ♀ less than 66 (44–65) .. 22

22. Above, pinkish brown, dark brown, or black, uniform (except near range of *fasciatus* where there may be some transverse dark lines anteriorly); usually found in association with gallery or montane forests ..... *D. s. palmarum*
(Forest Egg-eater)

Above, pale sandy or olive brown, with numerous, dark stripes or

blotches on flanks alternating with a dorsal series of large rhomboidal or squarish spots which may coalesce to form a zigzag vertebral band; usually found in savanna areas and in the vicinity of rivers and marshes ..... *D. s. scaber*
(Rhombic Egg-eater)

23. Ventrals more than 190 (193–242); color above, orange brown to pale yellowish brown, blotched or barred with darker brown or black..... *T. s. semiannulatus*
(Tiger Snake)

Ventrals less than 180 (144–180); color above, plumbeous to blackish, uniform or distinctly flecked with white.....24

24. Midbody scale-rows 19–21; ventrals 144–180; subcaudals 29–54; preocular 1 (rarely 2); postoculars 2 (rarely 1); occurs *outside* virgin forest areas, chiefly at low altitudes..... *C. h. hotamboeia*
(White-lipped Snake)

Midbody scale-rows usually 17; ventrals 145–175; subcaudals 35–56; preoculars 2 (rarely 1); postoculars 2 (rarely 3); found only in rain forest at high altitudes..... *C. h. tornieri*
(Sylvicoline White-lipped Snake)

25. Midbody scale-rows 19–21.....34

Midbody scale-rows 11–17 (all have 17 except *P. angolensis*).....26

26. Sides of the broad, brown, vertebral band immediately behind head irregular, soon developing into a zigzag line on nape and breaking up into an irregular dorsal series of paired spots; underside heavily mottled and flecked with brown which tends to form lateral lines posteriorly ..... *H. n. nototaenia*
(Eastern Dusky-bellied Snake)

If a dark vertebral band is present immediately behind head, its sides are straight and either more or less parallel or gradually converging..27

27. Rostral shield on snout prominent, beak-like.....28

Rostral shield on snout rounded quite normally.....29

28. Color above, pinkish brown, each scale more or less edged with darker; subcaudals over 90 (90–118)..... *R. o. oxyrhynchus*
(Eastern Beaked-Snake)

Color above like a *Psammophylax*, i.e. a fine, light, dark-edged, vertebral line with, on either flank, a broad brown band extending from nostril to tail; subcaudals under 70 (59–63); (*unknown* from Nyasaland but occurring at Mwaya on lakeshore)..... *R. a. acutus*
(Striped Beaked-Snake)

29. Maxillary teeth form a continuous series up to the interspace which separates them from the posterior pair of enlarged fangs.....30

Maxillary teeth interrupted below the *anterior* border of the eye by two greatly-enlarged fang-like teeth, separated before and behind by an interspace, followed by more small maxillary teeth, then a third inter-

space preceding the enlarged grooved fangs situated beneath the posterior border of the eye.....32

30. Subcaudals, if tail intact, 83–105; usually a single anterior temporal, rarely 2; belly white, markings, if present, take the form of short black *transverse* dashes (this distinguishes it from *P. s. sibilans* which usually has 2, very rarely 1, anterior temporals).....*D. lineatus*
(Lined Snake)

Subcaudals 50–66.....31

31. Temporals 2 + 2, 2 + 3 or 2 + 4; underside pure white; lowland form inhabiting savanna around Zomba, Nchisi, etc.....*P. t. tritaeniatus*
(White-bellied Grass-Snake)

Temporals 1 + 2, 1 + 3 or 1 + 4; underside gray or blackish; montane form inhabiting grassland plateaus of Mlanje, Zomba, Nyika, etc.....
P. t. variabilis
(Gray-bellied Grass-Snake)

32. Midbody scale-rows 11; subcaudals 57–82; a dwarf species.*P. angolensis*
(Angolan Sand-Snake)

Midbody scale-rows 17; subcaudals 78–121; size moderate or large....33

33. Habit robust, at least in adults; underside usually uniform white to plumbeous in adults, though young often exhibit a lateral series of *longitudinal*, discontinuous dashes; habitat usually near water.....
.....*P. sib. sibilans*
(Hissing Sand-Snake)

Habit slender; underside always exhibits a pair of sharply distinct, dark, parallel, longitudinal, lateral lines on white or yellow ground; habitat in dry savanna.....*P. sub. sudanensis*
(Northern Stripe-bellied Sand-Snake)

34. Color of adult ♂, uniform rich green, of adult ♀, brown, of young, variegated; eye rather large; habitat arboreal; attains six feet in length and is usually mistaken for a mamba by Africans.....*D. typus*
(Boomslang)

35. Crown of head profusely speckled with darker; ventrals 149–164[1]; subcaudals 125–148; attains 1250 mm.; habitat principally montane forests or recently deforested areas.....*T. k. capensis*
(Cape Vine-Snake)

Speckling on crown reduced to a few large spots forming a Y-shaped marking whose stem covers the interparietal suture while the arms extend to the supraoculars; ventrals 164–176[1]; subcaudals 140–146; attains 1400 mm.; habitat in lowland savanna adjacent to lake shore and probably along riverine forest.....*T. k. oatesii*
(Central African Vine-Snake)

[1] These figures are based on the small series of snakes secured by the expedition *in Nyasaland* and are subject to expansion; they do not represent the known range of the two forms outside the Protectorate.

36. Midbody scale-rows 21; (in Nyasaland known only from the type or its synonym *miolepis* taken at Cape Maclear) ..... *C. u. polylepis*
(Angolan Purple-glossed Snake)
Midbody scale-rows 19; (*unknown* as yet from Nyasaland but occurs in all surrounding territories; possibly not distinct from *u. polylepis*) ..... *C. u. warreni*
(Eastern Purple-glossed Snake)
37. First lower labial in contact with its fellow behind the mental ..... *A. l. lunulatus*
(Blotched-back Centipede-eater)
First lower labial not in contact with its fellow behind the mental 38
38. Young and adults have a black head; nape with a light-edged, 6-scale-wide, black collar; back and tail buff or reddish brown; below white; nostril normally in an entire nasal; size up to 315 mm..... *A. c. capensis*
(Cape Centipede-eater)
Young are black above with *two*, light-edged collars separated by 5 to 7 scales; back and tail uniform plumbeous or steely blue; below, throat white, belly basically so but heavily infuscated with gray; adults uniformly black above and gray or black below; nostril normally in a divided nasal; size up to 400 mm. (occurs with *capensis* but maintains distinctness without intergrading) ..... *A. guentheri*
(Black Centipede-eater)

Key to the Cobras and Mambas (Elapidae) of Nyasaland

1. Head short; snout broader than long; subcaudals less than 90 2
Head long, narrow; snout not broader than long; subcaudals more than 90 5
2. Ventrals less than 175; subcaudals less than 30; midbody scale-rows 13; color above of adults is uniformly black; in young the head is grayish and the body incompletely ringed with alternating broad (dark) and narrow (light) crossbars ..... *E. s. decosteri*
(Mozambique Garter-Snake)
Ventrals more than 175; subcaudals more than 50; midbody scale-rows 13–27 3
3. Eye separated from upper labials by suboculars; 6th or 7th upper labial largest and deepest, in contact with postoculars; anterior temporal single ..... *N. h. haje*
(Egyptian Cobra)
Eye in contact with third or third and fourth upper labials 4
4. Sixth upper labial not largest, not in contact with postoculars; third or third and fourth labials largest and entering orbit ..... *N. n. nigricollis*
(Black-necked Spitting Cobra)
Sixth upper labial largest and deepest, in contact with postoculars; color

above black ..... *N. melanoleuca*
(Black-and-white-lipped Cobra)

5. Midbody scale-rows 17–21, usually 19; ventrals 201–232; subcaudals (97) 109–126; buccal membranes white to bluish white ..... *D. angusticeps*
(Green Mamba)

Midbody scale-rows 21–25, usually 21; ventrals 242–282; subcaudals 105–127; buccal membranes bluish gray to black; color above of young bright green, ranging through olive when halfgrown to dark brown (never black) when adult ..... *D. polylepis*
("Black" Mamba)

Key to the Adders and Vipers (Viperidae) of Nyasaland

1. Top of head covered with large symmetrical shields; pupil round; reproduction oviparous 2

Top of head covered with small scales; pupil vertical; reproduction ovoviviparous 4

2. No loreal; eye minute; ventrals more than 200; subcaudals mostly single; body slender; color uniformly black ..... *A. b. rostrata*
(Zanzibar Burrowing-Adder)

A loreal; eye moderate; ventrals less than 169; subcaudals mostly paired; body moderately robust: color not uniformly black, usually a dorsal pattern of rhomboidal blotches or V-shaped spots ..... 3(*Causus*)

3. Snout more or less rounded; midbody scale-rows 17–21; ventrals 120–156 ..... *C. rhombeatus*
(Common Night-Adder)

Snout prominent, its end more or less turned up; midbody scale-rows 17; ventrals 110–128 ..... *C. defilippi*
(Defilippi's Night-Adder)

4. Subcaudals paired; lateral scales not smaller than the dorsals; body heavy; tail short, straight, not prehensile; habitat terrestrial ..... *B. arietans*
(Puff Adder)

Subcaudals single; lateral scales smaller than the dorsals; body moderate; tail short but with a prehensile curl; habitat: sedges, shrubs and trees; range: Rungwe Mountain, Tanganyika Territory south to Misuku Mountains, Nyasaland ..... *A. n. rungweensis*
(Rungwe Tree-Viper)